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OF THE

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TWENTY-THIRD ANNUAL CONVENTION

BY-LAWS

AND

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*The President reserves the right of naming other alternates should there be any vacancies on account of any in the above list not being able to attend.

PRESIDENT'S ADDRESS.

W. E. Wilson, M.D., Denver.

The time has almost arrived for me to relinquish the trust reposed, one year ago, in my election, by your unanimous vote, to the presidency of this, the Colorado State Medical Society. In this relinquishment it affords me pleasure to again thank you for the honor conferred, and assure you that I have done my best to make this annual meeting a success, both by the exercise of great care in the appointment of the committees, and by words of encouragement to said committees and to individual members of the society. Where I have failed in judgment or efficiency I may naturally expect to be judged by the immutable standard of justice, but I would invoke the sentiment of Southey in my own behalf, when he said, "he who is most charitable in his judgments is generally the least unjust."

Fortunately we have but few, if any, critics in the Society, who are discerning in nothing but faults, for it is generally agreed that such is a mark of unamiable dispositions; or, what is worse still, of bad passions. One or two such members in any society is a matter for the whole society to deplore.

Though a number of our members are absent at the World's Fair, we have been abundantly satisfied with the attendance at the various sessions of the annual meeting. We have been gratified at the number and scientific character of the papers read and the discussions which have followed. It is hoped that a greater proportion of what has been read and spoken at this meeting will be of permanent value than is usual at such gatherings. Judging from all that we have heard in these meetings, it is evident that those who have been active in the intellectual and practical part of our programme, have the knowledge necessary to success, and it is hoped they have the wisdom also to

apply that knowledge to practical and useful purposes. For without wisdom the right use or exercise of knowledge cannot be guaranteed, being, as it is, the aggregate of all human experience. But in claiming wisdom for the large number who have taken part, so acceptably, in these exercises, requires caution and some misgivings. Socrates, you remember, was pronounced by the Oracles of Delphos to be the wisest man of Greece, but he said there could be nothing in him to verify the Oracle, except this, that he was not wise and knew it, and others were not wise and knew it not.

It is a source of congratulation that great attention has been paid during the progress of our meetings to papers read and discussions held, and this argues well, both for ourselves and for those who have actively engaged in these exercises. Having a great desire to know all that is known in medicine we have had but little difficulty in confining our minds in more than respectful attention to what has been said; and this is a fountain of satisfaction to our active workers, for it has been truly said that it is a common way of calling a man a fool to give no heed to what he says.

It is conmendable, too, that committees have more fully done their work during the interim of our sessions, rather than risk interruptions during the reading of papers or while discussions have been held.

During the last twelve months, physicians, it has seemed to me, have been practically unfettered by the isms and pathies that have in the past somewhat trammeled our movements and impeded our progress. Our activities have met with the hearty co-operation of philanthropists everywhere, for the intelligent masses of laymen the world over, see that if disease is to be stayed there is no hope except in the regular medical profession. The cholera is stayed at our bidding. We met this scourge of nature at our wharves and said, thus far shalt thou go, and no farther, and the monster slunk back to the primeval nations from whence it sprung, and made it possible for the nations to assemble at our magnificent city on the lakes to pay homage to the achievements of man. We decree that

man shall live longer and the edict is obeyed. We labor and pray and wait for a cure for Phthisis Pulmonalis, and though baffled, we hope only for a time; in this wait, we find consolation in the prophylaxis which this Rocky Mountain region affords, for this scourge so dreaded in many parts of the world rarely develops here. We read of reciprocity in politics; why may we not inaugurate a reciprocity in humanities, by exchanging our rheumatic and excessively nervous citizens and those with organic heart disease, for those from lower altitudes, who have acquired predispositions to lung trouble or have this predisposition by heredity; and for all asthmatics who have no organic disease. Much of heart trouble seen in high altitudes owes its existence to antecedent rheumatism, and while the latter disease is preventable to a considerable extent, even in high altitudes in persons who can be taught caution, yet it is equally true that no amount of warning will always secure those who are predisposed from attacks, Rather than have rheumatic subjects come to the high altitudes of this region we would, in all candor, advise such subjects who are already here, and who cannot prevent frequent or occasional attacks, to seek an equable warm climate in a lower altitude. For their advantage we would gladly exchange such subjects now living in this altitude, with imperfect health and dangers more threatening still to come, if they remain here, for those of weak lungs, who are predisposed to Phthisis Pulmonalis or for those with this disease in its incipiency, affecting only an apex, with fairly good digestion, even if the family history is not good. It is not for the most good to the greatest number to split hairs in the study of the question as to how far a patient may go in tuberculosis and then be cured by coming to this region. It is a great hardship to send a consumptive from his comfortable home in the older states, who has advanced tuberculosis with bilateral disease or cavity formation, with hectic fever, night sweats, and loss of flesh. To send such a patient here is a crime to the subject and a great injustice to this region as a sanitary resort.

Thousands of citizens are living in the older states who are in constant dread of Phthisis Pulmonalis from heredity or

acquired predisposition, who if they were here permanently in this pure and dry air and warm sunshine, would live in contentment, prosperity and happiness to a green old age, giving to us for this elixir of life, blessings untold. This class of people belong naturally to us. They are ours by birth-right, for this is only a part of our great country. I verily believe that God made this bright sunshine, dry air and high altitude, for weak lungs; and now from the merciless climate of many of the eastern states to these afflicted, but precious ones of his race, He points his finger westward. A great throng of desirable citizens, whose weak lungs in one or more members of their families warn them of danger, would come to this region if they could be impressed with the fact that tuberculosis rarely develops here, that in the last one-third of a century, with no great care as to prevention, but little more than two score of cases of this disease have developed in Colorado. In this State we have a population of over half a million souls while Denver alone has about one hundred and eighty thousand. Less than 4 per cent of cases of Phthisis Pulmonalis seen in this Rocky Mountain region originate here, while it is probable, if the facts could be known, as they exist, in most of the states east of the Mississippi River, seventy-five per cent. of cases seen in any one of those States would be found to have originated there, and the per cent would be greater still had not the exodus hitherward from that region, of this class of persons been going on in an increasing ratio for more than two decades. Had our altitude and climate been no more favorable to tuberculosis than that of states in the older settled portion of our union, instead of reporting only a few dozen cases of Phthisis Pulmonalis as having originated here during the third of a century, since this region has been inhabited, many hundreds of our race who are now active and useful citizens would have, ere this, fallen victims to its ravages. Many families in, the older settled portion of our country where lower altitude and greater humidity of atmosphere exists, have scrofulous or tuberculous developments but live on from one generation to another under the same influences that have fastened these hereditary diseases upon them, sending occasion-

ally, it may be, some lone member of their family, who is far advanced in tuberculosis to this region. What would be infinitely better if it could be accomplished, would be for them to sell their property interests in the region where they have been so afflicted and come to this region for a permanent residence. What, break loose from all the dear friends of our younger life, leave the society of those that have stood by us in hours of misfortune and sore trial? Turn our backs upon those who have so kindly watched with our sick and dying loved ones? Yes, all this and more. "Yea all that a man hath will he give for his life." Here in this moderately high altitude we have much the same state of affairs, the diseases affecting our invalids differing much from those diseases of the other class. Here we suffer from rheumatism, nervous diseases and heart affections. This latter class would do better down where the others suffer most. Is it not within the bounds of common sense and practicability for us to establish here an "exchange" where all information could be given those seeking the betterment of their physical conditions and where the property interests might be so arranged as to avoid sacrifice and prove of mutual advantage. Phthisical patients might exchange their property interests for similar interests here in this region with those residents here who have found that this altitude is unsuited to their physical welfare. Such an "exchange" as I here refer to, if properly managed, and wisely advertised would call the attention of afflicted ones who would see before them an easy way out of the slough of physical despond.

It is reasonable to suppose that through these advertisements and the general interests that such an "exchange" would create, the afflicted would soon learn what would be to their advantage. It would soon become manifest that it is not so much the victim of consumption, especially not those far advanced in this disease, that should seek the high altitude, as the thousands with feeble lungs and predispositions. An "exchange" of this kind, with some competent medical officer as advisor and consultant, who would disuade those far advanced in tuberculosis from coming here, would thus save these sor-

rowful ones the suffering consequent upon disappointments, and preserve our locality from the odium of having, unjustly, to bear these cases on our mortuary reports.

It is a matter to be regretted that the Pharmacopœia for 1890, has not yet been published. Its usefulness, I fear, will become less manifest, the greater the procrastination in its publication. We learn from a digest of criticism on the United States Pharmacopœia, published by the committee of revision, that great care is being exercised in the work of revision, and it is certain that much more labor is being bestowed on the forthcoming Pharmacopœia than on any previous one. Preparatory to the revision in 1887, an alphabetical list of Pharmacopœial titles was printed in order that statistics regarding the frequency with which officinal and non-officinal articles were prescribed by physicians might be ascertained. Though the collection is not yet complete, or was not at the time of the publication of this digest, it warrants the publication of what is called a provisional list of articles recommended to be dropped from, and another list recommended to be added to, the Pharmacopœia. The list in each is long, but they are probably as you will find them in the Pharmacopœia when it is published. The list to be dropped and the articles to be introduced into our book of authority, introduction to which makes a remedy officinal, should always be of interest to the thoughtful physician.

Not to anticipate the Pharmacopœia too far, I will only mention a few of each list. The entire list of abstracts will probably be dropped. Among individual articles to be dropped are Arnicae Radix and its tincture; Antimonii Sulphidum, Aqua Creasoti, Argenti Cyanidum, Auranti Flores, Azedarach, Bryonia and its tincture, Cannabis Americana, Cascarrilla, Ceratum Sabinae, Cinchonina, Cinchoninae Sulphas, Cornus, Cupri Acetas, Emplastrum Assafœtidæ, Emplastrum Galbani; a number of extracts, including Extractum Stramonii Fluidum, Linamentum Cantharides, Linamentum Plumbi-Sub-Acetatis, Pilulae Galbani Compositae, Pulsatilla, Rhus Toxicodendron, Santonica, Spiritus Aetheris, Trochisci Catechu, Trochisci Morphinæ et Ipecacuanhæ. I mention the more important of the

list to be dropped, so that any one can put in a plea with the Committee on Revision, if desired, for the retention of any one or more of the above articles. A partial rough list of those articles to be admitted to the new Pharmacopœia, which have either been already recommended by competent authority or which appear from the records of medical and pharmaceutical literature to deserve consideration is also inserted. Many vegetable drugs are yet under critical trial and more reliable data will be at hand before the publication of the Pharmacopœia. Adonis (and Fl. Ext.) Antipyrina (a derivative of pyrazol), Apiol, Aspidosperma (and Fl. Ext.), Aqua Chloroformi, Caffinæ Citras, Cocainæ Hydrochloras, Codinæ Sulphas, Convallaria (and Fl. Ext.), Elixir Aromaticum (and possibly other elixirs chiefly those used as vehicles),Eriodictyon (Yerba Santa), Extracta Fluida (of some new drugs), also of some drugs at present officinal, such as Apocymem, Jalapa, etc, Glyceritum Acidi Tannici, Hyoscinæ Hydrobomas, Lanoleum, under this or some other name; Liquor Ferri Iodidi, Oleatum Cocanæ, Oleatum Quininæ, Paraldehydum, Pepsinum (undiluted), Phenacetinum, Piper Melthysticum (Kava and Fl. Ext.), Resorcinum, Rhammus Pershiana (Cascara), Salol, Sodii Bromidum, Effervescens Cum Caffinæ, Sparteinæ Sulphas, Spiritus Aromaticus, Strophanthus, Sulphonal, Syrupus Ferri Citro Iodidi, Tinctura Citro Iodidi, Tinctura Quininæ Aromatica, Urethanum, Viburnam Opulus (and Fl. Ext.) Zea (Stigmata Maydis and Fl. Ext,).

It is clear to me that therapeutics has advanced during the year, not so much by the addition of entirely new remedies, but by a greater familiarity with the comparatively new remedies, many of them having not only held their own but obtained a much wider range of usefulness.

A short list of these, selected at random from this class of remedial agents, which have grown in professional favor during the last twelve months may not be a useless waste of your time. Bromoform, (if a clear, colorless liquid of agreeable odor can be obtained) has increasing use in pertussis, and as an inhalent in diphtheria. Chloralamid is used in the same class of cases as previously but has grown in favor. As a hyp-

notic, it has a larger range of usefulness than other remedies of this class, and is supplanting to a noticeable extent some of its rivals, such as chloral and sulphonal. It has two valuable characteristics, one in not requiring larger doses after long use, and secondly in establishing the habit of sleeping by its systematic use, which is not dissipated by its disuse. It has been highly recommended in cardiac asthma and in sea-sickness. Dermatol (Bismuth Subgallate) was proposed two years ago as a substitute for iodoform. Though it has not supplanted the latter remedy, it is found useful in suitable cases. Comparative bacteriological experiments have been made on wet and dry cultures with aristol, dermatol and iodoform by Colasanti, as to their microbicidic potency. Neither had any effect on the microbes in the dried culture, after three days contact, but in the wet ones dermatol was effective in little more than half the time of the others. In moist eczema and burns a 10 per cent vaseline ointment of dermatol in the children's hospital at Graz, has acted well. The desicating effect of this remedy is more noticeable and pronounced than its antiseptic property. Europhen, another proposed substitute for iodoform, has had a large growth towards popular favor among physicians during the year, especially in throat and nose affections, in spreading ulcers and soft sores. In the Havana Eye and Ear Clinic beneficial effects have been met with in the use of ½ to 1 per cent of vaseline ointment in many eye affections. Euphorin is a powerful antipyretic and antirheumatic. It is said to be a more powerful antiseptic and less desicating than dermatol. Guaiacol containing 90 per cent of Creasote, has been in largely increasing demand during the year in the treatment of pulmonary tuberculosis, in which disease, it has proved uniformly beneficial. The benzoate salicylate, iodide and carbonate have all been used, but in the past year the carbonate has had the preference, causing less irritation than the other preparation. Hydrogen Dioxide (Peroxide of Hydrogen). This remedy has been used more largely during the year, its *range* of usefulness having been also extended during the year past. It is used as a disinfectant of polluted water, and it is claimed that one part per thousand of water contain-

ing sewage or infectious microbes, is fully sufficient to destroy the various organisms if left to act for twenty-four hours. It has an increasing use as a cleansing agent in foul wounds, abscesses and is a valuable diagnostic agent in determining the presence of pus, for Stuver found that when injected into a part in which suppuration was suspected, its presence was indicated by almost immediate swelling of the part. One great difficulty with this agent is that the solution undergoes rapid decomposition in a temperature above 60° Fahr., making it necessary to keep it in a cool place and even then changes are liable to occur. Ichthyol has grown in favor in the last year. Among foreign observers Drs. Klein and S. J. Radcliss ascribe valuable properties to it in the treatment of erysipelas. Dr. C. W. Allen in New York City still speaks as favorably of its use as he did a year ago. It has had its largest use in eczema, erysypelas and rheumatism, while Eschen reports 25 cases of uterine complaints treated with this agent. But time will not allow me to further epitomize. Enough has been said to show that therapeutics as a branch of the great tree of medical science has grown pari passu with the tree itself, which is beautiful in symmetry and magnificent in stateliness and foliage.

J. Whitcomb Riley ventured on dangerous ground, a year or two ago, in a lecture delivered in Denver, when he left his usually pathetic and satisfactory rythming to state in indigent prose that surgeons in the army during battles were generally found in the rear in a place of safety. This effort at witticism caused the countenances of a few of his auditors to broaden into thoughtless smiles, but it satisfied others of his hearers that however humorous and nimble-witted he might be at times in poetry, he was a buffoon and mountebank in prose. Jim Riley, as he is familiarly known, was presumably too young to have learned anything from personal experience of war, during our civil strife, as his exact age he leaves his best friends to guess. While his spontaneity as a dialect poet is remarkable, he could not have learned much of the behavior of surgeons in his trade of sign painter, or while he was a patent medicine vender, and certainly not while he was local editor of a newspaper, for this latter employment must have required all his

time, as he acknowledges to have strangled the poor little thing to death in three months. Poets generally, who were of the proper age to have wielded the sword or the musket in the times that tried men's souls, preferred the quiet of seclusion, for they well knew that "leaden rain and iron hail" were no respecter of persons. Instead of attempting to perpetuate the common error and popular fallacy that in time of battle the post of the medical officer is one of comparative safety, it should be known that in an enemy's country the difficulty with a position in the rear, even if a surgeon could remain constantly there, is that the wily enemy attacks the rear almost as often as the head of the column, and after the attack is made and the fight is on there is no safety anywhere, no more than there is in a Kansas cyclone or in a Syrian simoon. Thus the surgeon-general spake in his report at the conclusion of our Civil War in 1865: "I desire to bear tribute to the ability, courage and zeal manifested throughout the war by the officers of the medical department under all circumstances and upon all occasions. With hardly an exception they have been actuated by the highest motives of national and professional pride, and the number who have been killed or wounded bear honorable testimony to their devotion to duty on the field of battle." In the war of the rebellion thirty-two surgeons were killed in battle or by guerrillas and nine by accident. Eighty-three were wounded in action, of whom ten died. Four died in rebel prisons, seven of yellow fever, three of cholera and two hundred and seventy-one of other diseases incident to camp life or the result of exposure on the field. Six million cases of wounds and sickness were treated by the medical staff during the war. The surgeon is exposed like all other officers to the danger of excessive fatigue but is also exposed, unlike other officers, to the danger of constant contact with disease. The surgeon-general declares, after giving the sad mortuary record of surgeons during the war, that it was larger proportionally than any other staff corps. Their efficiency and steadfastness is more remarkable when it is remembered how suddenly they were called to the vast responsibilities which devolved upon them. Comparatively but little surgery had been seen by many of the army surgeons prior to

the war. Before that time but two courses of medical lectures had been required before graduation, these consisting of only four or five months each. But few railroads existed as compared to our present time, and the slow time made by passenger trains (twenty miles an hour) was a pretty sure guarantee against frequent accidents and human mutilations. But few buildings, as insecure as the old Ford's Theater, existed in those days, and building inspectors were presumably more conscientious than at present, though ours in Denver appear to be unusually alert and the mayor is their right hand bower. Mining interests were comparatively undeveloped and dynamite explosives and gasoline stoves were familiar to but few. In a word, surgeons had seen but little surgery, especially of the military kind. Our military commanders, many of them, and especially those of high rank, had been educated by our government at the military schools for such an emergency. All men subject to military duty, in many of the states, had been drilled in the militia for generations, but what special privileges and opportunities had been awarded the surgeons. I pause for a reply. Notwithstanding infinitely greater opportunities are now afforded medical students to learn surgery in the triple extension of time required for medical lectures and with hospital advantages sufficient to satisfy the most exacting searcher after surgical and medical truths, yet who does not feel that the future surgeons of our armies would be greatly aided in their work if the general government would establish one or two military medical colleges, where annually a few score post-graduates from each state could more thoroughly prepare themselves for brigade, division and corps surgeons in case of war with any of the great nations of the earth? Small bodies of troops, as a single regiment, are frequently for months on special duty, away from the possibility of medical consultation or the security which a library might afford. Hence the greater necessity for superior qualifications. An army physician is called a surgeon, but if he is only a surgeon having had special training only as such, he will find his duties, many times onerous and perplexing, for much the more frequently he will be needed as a physician and the necessity for skill as such will be great. Therefore military

medical schools would with great propriety spend a portion of their time in making their students familiar with disease in its epidemic and virulent form, so frequently seen in army life. They would be taught the modern methods of handling large numbers of sick or wounded, the most approved methods of transporting the same, and the best and speediest measures of preparing suitable food in hospital or by the roadside, when great emergencies arise. Nor would there be any the less necessity for these military medical colleges if the thousand highly educated physicians could be had, which Dr. John S. Billings, in his article in the Forum for February last calls for. He writes of "Medicine as a Career," and says that this country has no need of men possessing the diploma of a Doctor of Medicine; it already has at least twenty thousand more of them than it requires, or can properly support. But he thinks there are places ready for several hundred, say a thousand, physicians who have spent, say five years, at a good intermediate school, as preliminary to entering the University, at about seventeen years of age. He spends four years at the University, four years at the medical school, one and a half years in the hospital and two years in travel and special studies, being about twenty-eight years of age when he is ready to begin work, and his education, living, books, etc.,will have cost him about eight thousand dollars from the time he entered the University. With these figures before us, some will say that it is fortunate that the average duration of life is subject to augmentation, for if we go on increasing the time required for the most thorough preparation for success in a medical career, time will be called with many before even their preliminary studies will have been mastered, and posterity with the business activities of the world will have passed on gathering the fruit so luscious and ripe about them. But I am glad Dr. Billings has thus written, for it will serve a practical purpose, in impressing the fact that men with insufficient and meager preliminary education, and those in the study of medicine who have their thoughts divided by other occupations while in this study, and who are impatient for their degree will generally find when they get it that it does not guarantee success, and that they are among the thousands who are not

needed, and whom the world cannot properly support. But we do not believe the number of unnecessary physcians in our country is as great as indicated. We need a large additional number of earnest scientific medical workers throughout the Rocky Mountain region, and away north to the Columbia river and beyond, and south and west through the Mexicos and Arizona, for observation and notation of all facts pertaining to climatology and sanitation. The world is less acquainted with this vast country as a resort for valetudinarians, proportionately to its worth as such, than as a region of untold mineral resources. The pick and spade have probably done more to develop our resources than medical science, and yet when scientific physicians are less burdened with the care of dying consumptives, who should never have been sent here, they will be enabled to investigate, with more singleness of purpose our climatic possibilities, when grand results for our science and for suffering humanity throughout the world may be looked for. I am satisfied that we ourselves do not fully appreciate our own climatic wealth, and this is so more especially from the stand-point of prophylaxis. To prevent disease is the true mission of the physician, and when in the near future the world more frequently seeks their services in prevention, as is now being done with Cholera, a desideratum will have been reached, for the glory of the profession and the welfare of the race. In connection with this region as a health resort our mineral springs of which we write and talk are no mean factors. The usefulness of our mineral waters in disease has not been thoroughly tested, though they are being utilized more and more each year. It is quite probable that within the borders of Colorado there are health-giving springs which by intelligent and persistent investigation may prove to be mineral nymphs, and some one of them queen of all waters. At Steam Boat Springs in Routt county this state there are as many springs as at Vals, and their location, in many respects, is remarkable. These and other springs of this weird and magic country may yet prove of more value than our hidden mineral wealth.

Dr. Billings makes a further statement about current medical literature, which may act as a soothing balm to the

souls of those who may not have labored assiduously in this field of effort. Its current literature, he says "is of vast extent, and while much of this literature is worthless, much of it is suggestive and perhaps one per cent of it is of permanent value." Many writers in our current medical literature have laid the flattering unction to their souls that much of what they had written would be of permanent value, and now to be told that only one per cent of all that had been written was worth preserving, causes discontent to sit heavy on the heart, and though in our self-exaltation we may have plumed ourselves in our own deformity, yet others in the literary world, and outside of medicine in other fields of effort, are lower still, and their own acknowledgements are a significant part of their history. Even if only one per cent of what has been written is of permanent value, we are one per cent better than the preacher in Ecclesiastics who spake, as you will remember, thus disconsolately of his life work, "Thus I looked on all the works that my hands had wrought, and on the labour that I had laboured to do; and, behold all was vanity and vexation of spirit and there was no profit under the sun." But as to ourselves and our profession we are not so forlorn, and if we sorrow at times that there is still sickness and suffering in the world, it is not because the medical profession has not labored assiduously and with constant and consuming desire for its removal. But this sorrow cannot last long, for sorrow is the putrefacation of stagnant life. It is remedied by bold resolve and a vigorous and determined renewal of the encounter. Disease, the enemy that we are to fight, is in ambush, and many a philanthropist must yet yield his life a willing sacrifice to the insatiate foe. But in this struggle let us bear a heroic part, as have done our fathers in medicine.

> " Tis long ere time can mitigate your grief
> To wisdom fly. she quickly brings relief."

STATISTICS CONCERNING EYE DISEASES IN THE ROCKY MOUNTAIN REGION.

By John Chase, M.D., Denver.

I have often been asked by patients and physicians,if I did not consider Colorado climate particularly trying to the eyes. The impression is prevalent, that the forms of eye disease which are induced or aggravated by bright light, heat and dust are more commonly met with here than in the Eastern States.

In conversations with physicians long resident in the Rocky Mountain region, I have been struck with the almost universal idea that conjunctivitis, trachoma, and ulcerations of the cornea are a marked peculiarity of this region. The traveling public are so thoroughly impressed with the notion, that I have often met among eastern visitors to Colorado, the expressed fear of contracting eye disease during a short residence in our climate. The ubiquitous dark glasses are worn by hosts of our visitors, as a defence against the eye diseases which are supposed to lurk in our dust and sunshine. I have even heard it asserted that the bountiful supply of oculists in our Western country is in evidence as an effort of nature to supply an antidote for disease. If I am not mistaken, the records of this society will show that the experience of oculists is in accord with the sentiments I have expressed.

For several years I have been skeptical of the truth of this generally received belief, although during the first two or three years' residence in Denver I accepted as fact, that which every one seemed to believe. So far as I am aware, there have been no carefully compiled statistics to guide us in drawing scientific conclusions as to the relative frequency of various eye diseases East and West. I am fully aware of the errors which may creep into such comparisons as I shall make this morning. I know that the number of cases on which I base estimates for Colorado is small. I admit that methods of recording cases differ; for example, one observer may report a thous-

and cases from three or four hundred patients, while another reporter would allow but one record for each patient. Still, I believe that a comparison can fairly be made, after eliminating as far as possible, all cases of error and dissimilarity in records. A comparison of diseases, other than those I mention, would be interesting, but the chief object of this paper is to discover, if possible, if the Rocky Mountain climate predisposes the eye to certain diseases. As an indication of the youthfulness of our population, I have also compared the number of cases of senile cataract East and West.

I call attention then to conjunctivitis, acute and chronic, trachoma, lachrymal troubles, iritis, ulcers of the cornea, and senile cataract. From the various reports I happen to have at hand, I have selected as fairly representative of different sections of the country the following:

Presbyterian Eye and Ear Hospital, Baltimore.

Ophthalmic and Aural Institute, N. Y. for years 1887, 1888, and 1889.

St. Mary Free Eye and Ear Infirmary, Detroit.

Illinois Charitable Eye and Ear Infirmary for year 1890.

Wills Eye Hospital, Philadelphia, 1890.

Denver cases during 1892 and 1893.

If reports from further South had been taken, other elements, such as race characteristics would have required attention. I used three consecutive annual reports from the New York hospital to illustrate the fact that the ratio of disease in any institute is quite constant. My own report is made up from the record of private patients during thirteen months ending June 1st, 1893, and comprises 984 cases. The results would have been almost identical had I used clinical cases, but my private record is more reliable and therefore preferred.

	Acute Conjunct.	Chronic Conjunct.	Trachoma.	Lachrymal.	Iritis.	Ulcer Cornea.	Senile Cataract.
Pres. E. & E. Inf. Balt....	20.8		.9	3.7	2.6	2.01	5.5
O. &. A. Inst. N. Y. '87	6.1	13.2	4.2	2.3	1.4	3.1	3.5
" " " " '88	9.2	13.2	3.9	2.4	1.5	2.9	2.3
" " " " '89	4.7	16.1	5.4	2.3	1.3	2.9	1.5
St. Mary In „ Detroit.....	5.9	2.7	5.6	2.3	2.3	2.4	1.2
Ills. C. E. & E. Inf., '90....	5.8	5.4	5.9	2.1	3.2	4.2	2.7
Wills E. Hosp. Phil., '91...	9.6		1.4	1.9	1.7	2.7	2.05
Denver, '92 and '93.....	5.8	2.5	2.9	3.6	3.9	3.1	1.1

From an examination of the table it will be seen that Colorado is peculiarly fortunate in the matter of conjunctivitis as only one report gives a lower record in the acute form and none in the chronic. In the reports from Baltimore and Philadelphia no division is made in the basis of acute and chronic but the total of the two varieties exceeds that of Denver. I wish to call especial attention to the fact that we have in Colorado this year suffered from an epidemic of conjunctivitis. More than four-fifths of the cases in my report have been met since January 1st, of the present year. The disease became so prevalent in the city schools that the authorities in one or two instances asked for an examination of the pupils and took measures to limit the spread of the disease. Notwithstanding the existence of this epidemic the ratio of conjunctivitis for Colorado is exceedingly low.

In trachoma Colorado surpasses two of the reports and stands below the rest.

Inflammation of the lachrymal tract seems to be very prevalent in this region if the table is to be taken as a guide. I will

add that the result conforms to my experience of seven years in Denver.

In diseases of the iris Colorado also shows an unpleasant pre-eminence, but it will hardly be urged that this disease is much influenced by climate.

In ulceration of the cornea there seems to be a very constant ratio for all of the reports.

Senile cataract does not appear to be common here. and I believe for the same reason that we do not see many cases of glaucoma, viz., the youthfulness of the population. The western population is notably young. The pioneers of the early '60's are not yet old men, while the great mass of our citizens have come West during the last fifteen years, and the immigrants have been for the most part under thirty-five years of age.

During the year I have seen but two cases of true snow blindness and in common with other observers believe the disease to be rare.

It is difficult to explain these figures but I believe that fuller notes and larger collections of cases will confirm the conclusions drawn from this small table. You all know how irritating to the conjunctiva are our numerous sandstorms, and you have all experienced the unpleasant effect of riding over our plains or mountains in the glare of an unclouded sky. Personal experience would lead you to think the common impression right and my table wrong; but I believe that careful observation will confirm my conclusion. I offer the following as a possible explanation. In this dry climate and at this altitude the conjunctiva tends more rapidly to recovery than it does in the East where moist nasal catarrh is so prevalent.

I freely concede that the causes for conjunctivitis are found more frequently here than in the East. It is possible that hyperaemia of the conjunctiva is more prevalent, but it would be difficult to establish that fact. What I do maintain is that of the cases of conjunctivitis and trachoma requiring treatment we do not see so large a ratio here as in the East, while in lachrymal trouble and ulcerations of the cornea we have only to deal with an average number of cases.

DISCUSSION.

DR. BLACK.—During my experience here (covering a period of two years) it has been my good fortune to meet with very few cases of trachoma or other severe forms of conjunctivitis. There seems to have been an epidemic of acute catarrhal conjunctivitis this spring. It was of a mild form and responded to treatment rapidly, and would run its course in about five days without treatment. We have these epidemics of conjunctivitis here the same as everywhere, but not more frequently. I have met with but few cases of corneal ulceration. Dr. Chase has done well to bring up this subject for discussion, and I hope he will publish his paper in some Eastern journal, to help counteract the impression formed that we have a severe climate on the eyes.

DR. E. C. RIVERS.—My experience is a little bit different from the statistics, and a few years ago, I read a paper before this Society at Colorado Springs on the same subject, and there I cited a much larger proportion of chronic conjunctivitis than is shown on the board. I think this country is peculiarly prone to chronic conjunctivitis, and I find these cases very difficult to cure. Among these cases occur a great deal of trouble with the Miebonian glands and blepharitis, and in my practice, I find a greater number of such cases than I found in the East. My experience with cataract has been, that for each case fit to be operated on presenting itself, four or five others appear which are not matured and consequently are not operated on. My operations on cataract average about one a month, and for each case I see matured I see four or five cases not matured, and since the first of the present month, I have seen not less than three or four such cases of cataract This would make my percentage much larger than the doctor's.

The most important disease as far as statistics go, is trachoma. In the last three or four years, a French doctor maintained that trachoma did not exist; or if it did exist, it was not severe at 5,000 feet above the sea level. Since that time I have paid attention to my cases of trachoma, and think I find about the same percentage of trachoma here, as I

did in the East. One difficult point to sometimes determine, however, is, was the disease contracted in this altitude, as a very great number of our inhabitants are "migratory birds." They may not have contracted trachoma in this altitude, but elsewhere; but at the same time, I have seen a great number of cases undoubtedly contracted in this altitude.

It is impossible to take the patient's statement as to where trachoma originated, because nearly every patient that comes to you will claim that they have granulated lids, and it is hard to believe, when a patient presents itself with trachoma, and gives a history of having had sore eyes for years, that he had contracted the trachoma only lately.

I have moreover noticed no difference in the history of the disease, and its stubborness in yielding to treatment at this altitude.

There is one disease which the Doctor has not on the board, and that is glaucoma. My experience is that it is not as frequent here as it is elsewhere; at the same time I have seen a great number of cases of glaucoma, especially in some families of Germans, in whom it seems to be hereditary, but I have seen very few cases of acute glaucoma. Most of the cases which I have had, have been chronic ones. It occurs to me that cases of glaucoma in Colorado are less frequently met with than in the East.

Dr. LeMond.—I have been very highly entertained by Dr. Chase's unique compilation of diseases incident to this climate, and I would have been glad if I had heard the doctor say more concerning the etiology of the conjunctival troubles, a trouble that has vexed me a great deal.

In a certain character of cases, it is very easy to give a sensible diagnosis and the conditions that brought about the disturbances in the conjunctiva.

In the majority of cases that have come into my hands that have been of this character, especially in clinical patients, it seems to me that poor nourishment and the lime deposit in our soil are some of the causes of the trouble. In the better nourished cases we have nasal, or partial stenosis that

brings on this trouble. Thus far, all the cases in my hands of the latter character have been very much harder to control than the class of patients who come from poor surroundings, and who are out in the dust and sand a great deal. I think that there is no question that the amount of lime in the soil at the foot of the Rockies is one of the greatest causes of the trouble.

So far as glaucoma is concerned, I have seen very few cases during my stay in Colorado, and my experience bears out the fact, that so far as cataract cases are concerned, I have been lead to conclude that there was as great, if not a greater number of them here than further east. But I do not see that there is anything in our climate or altitude that would prevent us from having cataracts here, the same as in the lower altitudes.

The very large per cent. of our cases here are trachomotous. I think that a majority of these trachoma troubles are among our clinical population; I do not find much of it in private practice.

Trachoma comes about largely on account of a conjuctival disturbance, which in the poorer class of people are left alone, while in the better class, these eye troubles are cared for and attended to at once, so much, that there is a comparatively few of them that run into a chronic trachomous condition, and my experience has been that nine-tenths of trachoma, has been met with in clinical practice.

Dr. John Chase.—I was careful to limit what I had to say, almost entirely to those cases due to our climate, so I did not give any cases of glaucoma. I think we have less cataract trouble here than we have East. Our population is too young; look down the street, and see how many bald heads you will find. The majority of our population is not forty-five years of age.

A French writer insists upon it, that trachoma does not occur above 5,000 feet above the sea level, and further that he never saw a case of trachoma in a negro. I have seen case after case originate on our ranches, cases of trachoma and a few cases of glaucoma, and there is no question about it originating above this altitude.

As to the etiology of conjunctivitis; I want to say that this is an off year on conjunctivitis in Denver; this has been an exceptionally bad year, and I am sure that I am safe in saying that I have treated more cases since January 1st., than I have before since 1886.

As to the etiology of the cases that we do get, I think that chronic conjunctivitis is caused by an obstruction of the tear duct.

Now I think we have been sufficiently impressed with the argument to bear in mind that we have not such a bad climate for eyes, and if you gentlemen will keep your records, and let me have figures for another paper, I think we will establish that we do not put out people's eyes in Colorado.

HETEROPHORIA.

JNO. M. FOSTER M.D. DENVER

In looking over the field of special work done on the eye the past few years, and comparing the condition of our present knowledge of the anomalies of the extrinsic muscles, heterophoria, with the imperfectly understood and somewhat hazy subject known heretofore as muscular asthenopia, one is naturally led to believe that few branches of ophthalmology have made such progress. It has emerged from a state of doubt and much obscurity to one that is somewhat definite to say the least. Still there is much that remains undecided and more extended experience in examining these cases shows us many perplexing qualities, giving rise to problems that are difficult, or impossible to solve. It seems well in the beginning to establish the line of distinction between heterophoria and the ordinary deviation of the eye known as strabismus.

In heterophoria there is weakness of muscles, but no actual turning. Binocular vision is maintained, although it is done

at the expense of an immense amount of nerve force, producing nervous phenomena, pain, etc. In strabismus the eye is perceptibly turned, diplopia is present, if vision is good in each eye; and symptoms of asthenopia are rarely present.

These anomalies are classified by Dr. Stevens of New York as follows:

Heterophoria--Tendency of visual lines away from parallelism or muscular unbalance.

Subdivided into

Esophoria—Tendency of visual lines inward.

Exophoria—Tendency of visual lines outward.

Hyperphoria—Tendency of right or left visual line above or below that of the opposite side.

Orthophoria—Tendency of visual lines to parallelism or muscular balance.

The symptoms are those of asthenopia, pressure or pain in and above the eyes, headaches, and sometimes nausea: worse when looking at objects intently, even at a distance, but more frequently they are produced when doing near work, as in reading or writing. In a short time the annoyance and pain becomes so harassing that all use of eyes must be abandoned for the time being, and perfect rest secured. Only a short period of use will frequently inaugurate a headache that prostrates the patient for a number of hours. Even if reading produces only slight pain, it is impossible for it to be continued on account of the letters blurring and running into each other. This condition of affairs soon causes the delicate nervous system to lose its balance, leading on to graver nervous conditions, ending possibly in epilepsy, as asserted by men of undoubted ability and veracity. That so grave a disorder as epilepsy can be caused by derangements of the extrinsic muscles of the eye, or cured by relieving them, is a subject of considerable dispute, and likely will continue to be until more extended observation proves or disproves the matter.

The causes of heterophoria are also matters of difference of opinion, and well they may be, for a number of cases are constantly presented to us that are difficult to fathom as to

their origin. Our thoughts would naturally first direct us to the inquiry as to the effect of the weakness of the general system upon a special muscle or set of muscles of the eye. That they could be affected would be readily admitted, especially the internal recti, that are compelled to do extra service in all accommodative efforts; therefore it would be a matter of little surprise if exophorias were found prevalent in debilitated persons of studious habits. Such a condition of affairs does not seem to be the case; these errors do not occur with more frequency in anaemic people even in those without errors of refraction, than in those who are enjoying excellent health in all other respects, and we are rarely able to note a total of symptoms when we feel certain in ascribing the heterophoria to a depravity of the general system.

More often we are compelled to seek the cause in some special loss of power or want of development of a given muscle, but we are unable to demonstrate its origin, or assign a cause therefor.

A certain distinct number of cases can be proven as originating from errors of refraction, but a vast number of our patients, undoubtedly heterophoric are beyond question emmetropic, and it seems a matter of surprise that even one man of national reputation should contend that all heterophorias are caused by errors of refraction, and goes even further, considering them of small significance when they fall short of actual strabismus, being readily relieved by simply correcting the refractive error. That a certain number are amendable to this treatment is beyond dispute, as will be referred to later in oblique astigmatism, but the majority of cases will continue to suffer with aesthenopia where all attention is paid to the refraction and none to the muscular balance.

Text-books published the past few years give the cause of muscular aesthenopia, as myopia pure and simple, explaining that they require less accommodative effort for near vision than a hypermetrope or an emmetrope, therefore the tendency to divergence appears. Our case books contradict this statement, for carefully noted and accurately made tests of refraction show many more cases occurring in hyperopic, emmetropic

and astigmatic eyes, than in those of near-sight, proving that the state of the refraction does not influence any appreciably great number of cases. The methods of determining the existence and degree of insufficiencies of the extrinsic muscles of the eye, have undergone great changes. For a number of years Graefe's method was used almost exclusively It consisted in looking through a prism at a dot traversed by a vertical line upon a card held at fourteen inches distant. It has practically been abandoned since it was found that the results were not to be relied upon. The past few years several tests have come into vogue, all of them of more or less value and exactness for determining the relative strength of these muscles. No one test should be relied upon, for an error creeps in when we little look for it, and it is only after repeated attempts that we can feel anything like certain that we can locate the trouble properly. One usually has his own method of examining cases and does well to follow it carefully. Among the many ingenious devices I will mention a few.

Maddox's rod test is a good preliminary one. It is simple, readily applied, and inexpensive, but unfortunately you cannot always rely upon the results. By looking through a glass cylinder held before one eye the flame of a lamp becomes a long streak which is so different from the actual appearance of the flame that no effort is made to unite it with the true image of the lamp in the uncovered eye, the muscles are therefore placed at rest. In orthophoria, or normal muscular tension the streak exactly divides the flame; when insufficiencies are present they are separated and readily measured by prisms.

The stenopaic spherical lens combines some advantages but is subject to the same faults as the rod test, the eyes at times appearing orthophoric even when prisms are interposed, rendering them heterophoric. Savage's double prism is always worthy of employment and at times clears up a dark spot. These tests give us valuable information but the phorometer is by far more accurate and has the advantage of showing only what errors really exist, even if the full extent is not brought to light. The instrument is too elaborate and your own famil-

iarity with its use will render further remarks upon its employment unnecessary.

The foregoing tests are made with the muscles in a state of rest, that is, looking at an object twenty feet distant. Necessarily they do not show the entire condition, for often a great change in the muscular equilibrium takes place when looking at near objects, as can be instanced in eyes that show esophoria for distance and exophoria for near. This is a condition of insufficiency of convergence. It is readly shown in a rough way by approaching an object to within six inches of the nose and having the patient gaze steadily at it. If an insufficiency is present, one or the other eye will deviate outward, slowly or with a rapid motion.

Next we form a better idea by observing one eye in exclusion and approximating the degree with the number or strength of the prism necessary to overcome the divergence. Finally it is necessary to test the relative strength of the muscles by their ability to overcome contrary prisms, that we may verify our results and feel sure of our position.

The examinations are rapidly made, not wearying to the patient, but should be carefully and accurately made, and often more than on one occasion.

Something should be said in regard to insufficiencies of the obliques, a proper understanding of which we are indebted to Dr. Savage, of Nashville, who has given the subject much close study, and contributed several valuable articles to our literature. These muscles rotate the ball on its antero-posterior axis, twist it, in other words. Their effect is best demonstrated in oblique astigmatism and is observed after proper cylinders are fitted when the patient tells us that vision is disturbed, vertical lines appear to be tilted, or the floor inclines up or down. In a number of cases these symptoms disappear in a few days. Before glasses were fitted the oblique muscles rotated the ball so that the best meridians occupied relative position to the retina, to avoid diplopia. After all meridians are cleared the stronger muscles gradually relax as the necessity of clearer vision disappears.

The treatment, like all other points in this subject, is a matter of difference of opinion, and is a natural consequence of but an imperfect understanding of the question, and man's natural capacity of looking at a thing from different standpoints. Under the regime that classified those troubles as muscular asthenopia, a tonic, preferably of strychnia, exercise of the muscles with prisms, bases out, completed the measures for relief. To be sure electricity was occasionally applied to the weakened muscle but its use was not at all universal. Recently surgeons have been more bold in operating on these cases, and the scientific adjustment of prisms and decentered lenses has brought the treatment quite up with the methods of determining the degree and nature of the trouble. Just now there is considerable diversity as to the manner of employment and strength of prisms to be used, whether a 2° or a 15° prisms obtains the best results. Most ophthalmologists agree however, that only a heterophoria of slight degree, say 6°, is amenable to prismatic treatment. My own experience coincides with this and the weaker numbers of prisms have been most satisfactory in my hands. Prisms used in the form of decentered lenses are attracting many converts and doing good work. In the higher degrees of heterophoria we are compelled to do partial or complete tenotomies of the stronger opposing muscles to obtain results. They are done by incising the conjunctiva and proceeding as in operations for strabismus or a neater operation is done subconjunctivally. The technique is too familiar to warrant description but the results are full worthy of consideration, for in carefully selected cases, with ordinary operation skill, results are gratifying and the relief to the patient is often very great. In this way we are able to bring the eyes back to parallelism, the rays of light are accurately focused on the macula lutea and the muscles are relieved of all strain and fatigue, thereby ridding the patient of pain, headache, nausea and other nervous phenomena.

I am sure that if we give the extrinsic muscles of the eyes their proper share of attention we will be able to relieve much suffering and annoyance in persons who have heretofore sought relief in vain.

DISCUSSION.

DR. JOHN CHASE—I do not like to see such a good paper as this go by without notice. Whenever I pick up a journal and see on the title page "Heterophoria" I look forward to something very radical. There is so much new about it that you are apt to go too far. I therefore commend the doctor for the conservative paper placed before us.

St. John Roosa does not place much interest in heterophoria. He took one hundred patients who had never complained of eye trouble, and found ninety-three out of every hundred had heterophoria.

There is a great deal to be worked out yet. We used to fit our patients with the greatest care, taking in all the facts, and we often found after we had tried our glasses that they would not fit without giving rise to headaches, etc., and we did not appreciate the cause until Stevens directed attention to "Heterophoria." I have here an instrument that we use in gymnastic exercise for the muscles, consisting of a series of prisms; in using it, it is passed rapidly before the patient's eyes, and many and many is the case that I have succeeded in making comfortable with it. I have used it for seven or eight years.

I have always made it a rule to strengthen the weak muscles rather than weaken the opposing ones, operating only after other means have failed.

DR. LEMOND.—This paper of Dr. Foster's I think a very commendable one, and I think it is valuable if for no other reason than on account of its conservativeness. I think more damage has been done by men who get up new forms of treatment and who do a lot of damage by flying off at a tangent, and using radical methods of treatment, than those who work on more conservative lines.

I notice this question of Heterophoria and muscular asthenopia which has been developed within the last five years, is getting to be quite a question, and I do not think many of us know what to do with it.

At the recent convention in Milwaukee I do not think there was a subject discussed so thoroughly as this question.

We had a half dozen ideas, and I do not think there were a half dozen men agreed on any one mode of treatment.

When you go to cutting the muscles you will find that you do not meet with success; you do occasionally, but oftentimes you find that you have hedged yourself in. After prescribing prisms, they will be found to do good for a week, and then get out of gear, and those men who have thought to have discovered the remedy have found eventually that they lacked just a little of discovering the proper thing.

It reminds me of a story that I heard some time ago of a negro who made a wager that he could eat the largest potato in the neighborhood; they had one of the largest they could find prepared for him with plenty of gravy, and he sat down to eat it; he would first take a bite from one side and then turn it around and take a bite from the other. After he had eaten as much of it as he possibly could, he said: "Look here, Boss, It 'pears to me, that the more of this tater I eats, the bigger it gets." And so it is with Heterophoria.

Tenotomy will not do in one-half the cases; prisms I doubt if ever should be prescribed. Give the muscles gymnastic exercises three times a week with prisms if you think best. Correct the hyperophia or myopia and the always present astigmatism, and have your patient rest and take care of his eyes.

If more would follow Dr. Foster's advice, less damage would be done.

Dr. Black.—While I have been taught to believe very little in heterophoria as being productive of asthenopia by Dr. Roosa, I deviate every now and then and do a tenotomy for the correction of muscular insufficiency. I find the tenotomy results in comfort to the patient, hence I consider it of value. I have a Stevens' Phorometer in my office and always use it as a final test in refraction cases. The use of prisms worn before the eyes for the correction of the insufficiency, has not proved in my hands anything more than a relief, so long as worn, and then strength has to be increased from time to time as the insufficiency of the muscles increase from the weak muscles being favored. I think prisms should be prescribed before a tenot-

omy is resorted to, for the reason that if prisms do not relieve the asthenopia a tenotomy will not do so. Where the insufficiency is due to a run-down condition of the system, the proper tonic treatment and the use of prisms to exercise the weak muscles especially if they be the interni, and prisms worn before the eye for the relief they afford, will be indicated. Decentered lenses are not effectual. A number of times I have tested for insufficiency while the eyes were corrected by a pair of glasses in which the pupilary distance was away off from what it should be, and have been surprised to find the same with or without glasses.

The conservative plan is my principle. Always correct the refraction, and if relief is not forthcoming from said correction together with any constitutional treatment indicated, then add prisms if prisms relieve the asthenopia; but if the heterophoria does not become less regardless of constitutional treatment and daily exercise of weak muscles, then as a *dernier ressort* tenotomize.

Dr. Green (Pueblo)—I agree very much with Dr. Black in his views on the subject. I am not much of a believer in heterophoria as causative of the great number of symptoms ascribed to it. I never use a lense, or fit a prism over the eye to be worn constantly. I am sorry Dr. Foster in his paper did not call attention to a recent article by Dr. Savage in the *Ophthalmic Record*, wherein he considered the rythmical contraction of the muscles; using the prism, thereby causing the muscles to contract, then removing the prism and allowing them to relax. I think by constant use of the prism we keep the muscles in constant contraction. By alternately putting on the prism and removing it, we cause the muscles to contract and relax, and thereby strengthen them the same as any other muscle.

Dr. Rothwell—From my experience (I am not a specialist on the eye) I remember when attending the University of Michigan in 1880, I had trouble with my eyes, the first time in my life. I was attending classes and working a good deal in the dissecting room. The ventilation was poor, the air was bad and I began to have what I never had before—headache. I

called on Dr. Frothingham and he said the external rectus muscle was too strong, and that he might have to operate upon it; but before he would resort to that, he gave me a prism to practice with, and I practiced just as he directed for one month, with the result of a complete recovery and no return of the symptoms since.

I have made it a practice to keep prisms in my office, and when I have a case of persistent headache I try to find if there is any trouble with the muscles of the eye, and if there is, I let them practice as I did, and often find that recovery has been complete. I think gymnastics resorted to in that way, are very beneficial. I hardly think using it continuously, however, would be beneficial.

Dr. H. T. Pershing.—This question touches on my field very closely. It is a matter of great importance in Neurology to know what the proper balance of the ocular muscles is.

I think that Dr. Foster's position in this paper from a neurological standpoint is correct. On the other hand I think Dr. Stevens' position is decidedly incorrect, and while we should undoubtedly give some credit to him, as we do to any extremist following on a new line, even if he goes too far, still he has done a good deal of harm. I have seen two cases in which I had a good opportunity to judge of the condition of the eyes (which have grown worse under repeated operations done by Dr. Stevens himself, one of them being now a patient of Dr. Coover). I am convinced that a slight degree of Heterophoria can in itself make immense trouble for the patient; make him feel dizzy, make him feel confused, make him so timid that he is afraid to cross the street where there are a number of vehicles. These symptoms can be relieved, in many cases absolutely, by exercising the weaker muscles, adjustment of prisms or an operation. I know that Dr. Foster in some of his cases has obtained beautiful results by operation. I do not think that Dr. Roosa's statistics of his ear patients are fairly applicable to the general run of patients. I am in the habit of testing the eye muscles in my nervous cases and I do not find a large proportion to have Heterophoria, even of a mild

degree. If the patient is neurasthenic, or subject to headaches, I think it is of the utmost importance that Heterophoria should be skillfully treated; but when it occurs in epilepsy or chorea, I do not think it is so important. I think then it is only a symptom of the disease, and not a cause of it.

There have been, it is true, a few cases of epilepsy reported as caused by defects in the ocular muscles and cured by operation, but the number of such cases in proportion to the whole number of epileptics is so small, and the chances of error in getting at a true cause are so great that we may well doubt the correctness of the report.

I congratulate Dr. Foster on giving us a fair presentation of this subject, one that a neurologist can agree to as well as an oculist.

Dr. Foster.—In referring to the effect of the action of the prisms on the heterophoria, I have to say that I disagree with Dr. Black in as much as he says if the trouble is corrected for a short time with prisms, that it returns after removal. I have had a number of cases, and prominent people in the city, who two years ago came to me, and simply by exercising of the muscles have gotten entirely well; not by wearing prisms, but simply exercising. In other cases that we put prisms on, they are wearing them now, and at times, they say they get so well, they are leaving them off altogether; I know of two cases where they were left off for six months, and they have had no trouble.

In regard to Dr. Savage's article on rythmatic exercise, I have read that article, but he has had only a small amount of practical experience with it. It may turn out to be a very good thing. Dr. Roosa's ear cases, I must say are a little perplexing. I have had patients come into my office with no subjective symptoms of asthenopia and on testing found eight degrees of heterophoria. A great many people are careless about their eyes and suffer with some form of heterophoria. It is a common thing for two people to apply to you for relief of headache and one will have 2° of heterophoria and suffer a great deal, and the next patient may have 10 or 12° and suffer little or not at all. It is just as Dr. Chase says, there may have been just a run of these patients when he spoke as he did.

OPERATIONS UPON THE EYE FOR COSMETIC EFFECT.

By G. Melville Black, M. D.

Within this realm of surgery there is much that is in dispute as being justifiable. It is claimed by the most conservative that operations upon the eye are not warrantable except to restore or increase vision.

A disfigured eye detracts very greatly from the personal appearance of the individual, as well as from their personal comfort, as they are constantly reminded by the curious gaze, or an inquiry, that their abnormality is noticeable and a subject of comment.

If the defect is small, such as divergence or convergence of the optical axes, a pterygium, a partial leucoma of the cornea, monocular mydriasis, or cataract, it is a puzzle to new acquaintances, and continues to be so, until they get used to the appearance, inquire into it, or have a good look at it. As a rule so long as the trouble is not understood by these inquisitive persons, and it is surprising how many of them there are in the world, just so long, will they continue to notice the defect.

If the possessor of the abnormal eye is sensitive on the subject, and the majority of them are, the actions of their friends and acquaintances will be a source of much annoyance.

Let a young or middle-aged person have a cataract in one eye only, of course he knows what his ailment is, and if he is sensitive on the subject, he is painfully aware of it. His acquaintances notice that the pupil of that eye is white instead of being black, and not being cognizant that he has a cataract, as the majority of people do not know what a cataract is, they are not conscious that the eye is sightless, and sooner or later wound his feelings by asking him, "What is the matter with your eye?" This constant annoyance finally becomes tiresome, and he seeks an oculist to see if something cannot be done to render the defect less conspicuous. He is probably informed

that he had better leave it alone, for the reason that, if it is operated upon, it will not work with the fellow eye, and he will probably see double, that he stands a chance of losing the eye altogether, and of the operation being only a partial success, and the result cosmetically not as good as before the operation.

Another patient consults the oculist for divergent squint, and is informed that it requires an extensive operation to correct the deformity, and that he had better leave it alone.

A patient with a partial leucoma of the cornea comes in, and he is informed that a tattooing operation might be done with some benefit, but that it is not always a success, and that sometimes the operation sets up a violent inflammation requiring him to for remain away some time from business, and that he had better not have anything done.

A patient with a pterygium comes in, and if the growth has not extended far enough over the cornea to interfere with vision, he is advised to let it alone for a time.

This, to my mind, is the reason why we see so many people who labor under the disadvantages spoken of. Their appearance is a source of trouble to themselves and to the people with whom they come in contact.

Within the last few years the operation of cataract extraction has been made one of the most successful in the line of surgery. Only in about two per cent. is the eye totally lost, and three per cent. more will cover the failures. A total of five per cent. would be called unsuccessful from a cosmetic point of view. These are statistics of cataract operations in general, in both old and young subjects, with a view of restoring vision in the majority, and for the cosmetic result in the minority. I do not believe the percentage of failures would be as great as five cases in the hundred in selected cases of cataract in young subjects.

It is to be remembered that we are not operating for a visual result, and if the eye is not corrected by a glass, the vision is not enough in this eye to interfere with its fellow, as the image formed upon the retinæ of the two eyes will be so dissimilar that the less distant image, or the one formed upon

the retina of the eye operated upon, will be suppressed, and double vision will not result. This double vision theory is frequently submitted to the patient as one of the reasons why the eye should not be operated upon. If the refraction of the eye is corrected, as a matter of course diplopia will result, and the result cosmetically ruined, as a strong cataract glass is anything but a comely addition to the face.

There is no more probability of the eye "turning out" after the operation than before. If divergence has already taken place before operating, a double defect presents itself for correction. If, then, to recapitulate, the eyes are straight before operating, the latter does not increase the disposition to divergence.

The operation of simple extraction, *i. e.*, where an iridectomy is not performed, leaves the eye in appearance equal to its fellow, as I have had the pleasure of demonstrating to myself several times.

In divergent squint the operation of advancement of the internal rectus muscle is not indicated except when the amount of divergence is extreme.

The operation of Gruening's has proved quite successful in cases of moderate divergence. This operation consists in doing a tenotomy of both external recti muscles, and drawing the eyes into marked convergence by a thread inserted into the sclera to the nasal side, and close to the cornea of each eye, being tied in the median line over the nose. A wire bridge to fit over nose with eyelet at each end for threads to pass through, has been devised to hold thread down on a level with its point of insertion into sclera. The operation of advancement, if done dexterously, is successful where the operation of Gruening's would fail, and involves but slight danger, one case in a hundred being lost from ophthalmitis. I believe this one case could be eliminated from our statistics, if it were not that so many operators adopt such poor methods of doing the operation.

In partial leucoma of the cornea, a tattooing operation involves little danger, is very simple, and greatly improves

the appearance of the eye. The irritation rapidly subsides, and the patient is scarcely prevented from his usual routine of life. If the leucoma is total, the tattooing should be done at repeated sittings, thereby obviating the reaction that would naturally follow such an extensive pricking of the cornea.

Pterygii should be removed as early as possible, and not allowed to continue until serious and irreparable damage has resulted to the cornea. A pterygium which has only begun to encroach upon the cornea will alter its curvature so that in some cases glasses will be required forever after to correct the astigmatism which has resulted therefrom.

Sufficient diseases of the eye have been mentioned for which operations to improve the personal appearance of the patient are indicated. Therefore I will not prolong this paper by citing others.

Why allow the patient to be annoyed by an unsightly deformity when it is his desire to be relieved of it, and it is within our power to interfere with all the chances in favor of a good result? It may seem somewhat strange to you that this is not done. Look about you and see how many remain without surgical aid. Ask these people, and you will find they are bearing with their infirmity because they have been advised by some oculist not to meddle with it.

DISCUSSION.

Dr. E. R. Girvin.—There are only two points in Dr. Black's paper upon which I think there can be any discussion. One of them is in regard to the operation for cataract.

If I remember correctly, the doctor reported a case sometime ago of an operation for cataract. In that description of the operation, it left the impression on my mind that he had iritic adhesion, or the iris had become attached to the lens capsule. Now in that case I cannot see the advantage of operating, allowing the risk of even the small percentage of failure in such cases.

The operation was performed without iridectomy, thus after the instillation of eserine, adding to the danger of posterior synechia, and any subsequent vision being obtained in

case of injury to its fellow. For purely cosmetic purposes, I cannot see the advantage of taking out the lens.

The simple fact of a white pupil, is not such a fearful thing that a man should hold up his hands in horror. I acknowledge that many people are curious and make remarks about an eye of this character, but what does that signify? And in the event of the sound eye becoming affected or destroyed, you would practically have two eyes destroyed.

I agree with the doctor, that as far as the eye is concerned, if he had not cared about the interference of others, it would have remained the same as it always was.

As regards the difference in refraction between the two eyes, you will sometimes find one very far-sighted, which is practically the same in binocular vision as that after removal of lens.

I certainly do not believe in interfering with the eye for cosmetic effect as far as cataract is concerned.

As regards leucoma, I believe that every oculust should relieve that. In my experience I have treated twelve eyes, and I have had very little trouble. If it is very large, it should be done by very small operations at a time. The other diseases, I think should be remedied as soon as possible.

Dr. Bane.—I most certainly agree with Dr. Black, in that there are a number of operations to be performed on the eye and its appendages for cosmetic effect. They may be done with justice to the patient, the public, and with credit to the eye surgeon. Within the past few months I have operated upon some cases of converging strabismus for cosmetic effect. As the converging eyes were amblyopic, there was nothing gained for the patients in the way of vision.

The history of one of these cases, as obtained from his mother, was, that in the early months of gestation with this child, she was alarmed by an unexpected meeting with a man having converging strabismus. When the child was born, it was discovered that his left eye was converged, and corresponded with the man's left eye.

Recently I operated upon a case of congenital ptosis of the

right upper eyelid, Dr. Black assisting. I did what is known as "Birnbacher's operation." The operation consists in making an incision through the skin of the lid, parallel to the upper border of the tarsus. The edge of cartilage is dissected free. Three strong silk sutures, each armed with two needles are passed through the upper tarsal border, so as to make three loops near equal distance apart. The needles are passed upward beneath the skin, and brought out rather close together in the upper margin of the eyebrow. They are then tied over a small roll of iodoform gauze and tightened so that the patient can barely touch the margins of the lids with an effort; the wound is then closed with sutures, and the loops are allowed to remain in for about three weeks. The resulting catricial bands connecting the lids with the frontalis muscle, enables the patient to elevate the lid with ease. I obtained excellent results in the case above alluded to.

Dr. Black.—Dr. Girvin says that the danger is increased in cataract extraction when an iridectomy is not done. I believe that recent statistics will show that the danger has been lessened by dropping the iridectomy, rather than increased. In regard to the case mentioned by Dr. Girvin, there are no iritic adhesions. The pupil is dilatable, reacts to light, and also reacts to the accommodation of the other eye.

Even if we did have a few iritic adhesions, which are quite as frequent in cataract extraction with iridectomy as without it, they do not necessarily mar the cosmetic visual result.

I am in favor in young people who have a cataract in one eye and want it removed, of removing it, and I am sorry that my paper did not bring out more discussion on that point. I think that I stand somewhat alone in Denver on that particular operation. The paper that I read before the County Society some time ago, brought out considerable discussion on that subject, and the discussion disclosed the fact that a number of physicians in Denver were not in favor of removing cataracts in young patients for cosmetic effect.

ULCERS OF THE CORNEA.

By William C. Bane, M.D., Denver.

The importance of this affection, I believe justifies a brief review of the subject.

Corneal affections constitute over one-fifth of the eye cases that come under our care.

Of the three principal types of inflammation of the cornea, ulceration is the most common. The numerous varieties of corneal ulcers have been conveniently grouped as superficial and deep.

The superficial class includes those limited to the epithelial layer and are most frequent in young subjects. This is especially true of the phlyctenular ulcer, which occurs in the delicate and strumous.

Not infrequently is the superficial ulcer the result of traumatism, the accident occurring in persons whose blood state is poor, or the wound becoming infected, an ulcer forms. The symptoms of superficial ulcers vary from slight irritation to marked photophobia, lachrymation, and pain in and around the eye. The pain is frequently paroxysmal in character. The ulcers differ in appearance, location, course and importance. The phlycetenular ulcer is usually small, circular and of a yellowish gray color. When located at or near the corneal margin, which fortunately is its most common seat, there may be one or more of them. Their course is short, as a rule, and little or no opacity remains. However, the phlyctenular ulcer does not always run so mild a course. The subjects being delicate, if the treatment is not proper, the ulcer may enter Bowman's membrane and finally result in perforation of the cornea, or being central in location, produce such an opacity as to permanently impair the vision.

Fig. 1 illustrates this type of ulcer.

The so-called dentritic ulcer, is an exceedingly interesting one. It is limited to the superficial layer of the cornea, and is

indicative of a blood state due to or like that of malarial poisoning. The arborescent or dentritic shape of the ulcer is readily recognized by those who are familiar with this form of keratitis. Some excellent papers on malarial keratitis, and keratitis dentritica, have been published within the past thirteen years. The first clear description of this disease was by Dr. Kipp of Newark, N. J., in 1880. (2) (3) (4)

The following year Dr. Noyes, of New York, and Dr. Hotz, of Chicago, published papers on keratitis due to malarial infection.

In 1889, at a meeting of the American Ophthalmological society, Dr. Kipp (5), read another paper, in which he gave an admirable description of the disease, and stated that of the 120 cases he had treated, since his first paper was published, in 90 per cent of them, there was a clear history of malarial infection. His conclusions were confirmed in the discussion by Drs. Noyes, of New York; Green, of St. Louis; Sutphen, of Newark, Theobald, of Baltimore, and Miller, of Providence.

Dr. Kipp, who has made a careful study of this form of keratitis has observed that "following a paroxysm of intermittent fever a series of small, grayish, opaque, elevated dots, like minute phlyctenulae appear on some part of the cornea, usually not far from its margin, arranged in a line like a string of beads. On the following day the elevations have disappeared and in their place is to be seen a narrow furrow with a hazy floor and grayish ragged edges. At the same time or perhaps not until some days later, one or several short grayish branches develop on one or both sides of the original furrow.

Unless arrested in this stage by treatment, the main furrow and its branches continue to grow in length, without however, increasing in depth or width. "The furrow always remains quite shallow, and probably seldom penetrates Bowman's layer." The symptoms are similar to those of phlyctenular keratitis, excepting that there is less conjestion of the ball, the pain is more severe, especially in the supra-orbital region. There is also more anaesthesia of the diseased surface of the cornea, as first pointed out by Dr. Noyes, (6) of New York. Fig. 2, after a drawing by Dr. Kipp, illustrates the ulcer of

malarial keratitis. In June of 1892, Haltenhoff (7) published an interesting *resume* on keratitis dentritica or herpes. From Haltenhoff's paper we learn that Habb and Hagnauer, of Zurich, take the ground that the malarial keratitis of Kipp and his followers, and keratitis dentritica of Hansen Grut, Emmert and others, is nothing more than the ulcerative stage of febrile herpes of the cornea, as described by Homer, of Zurich, in 1871. Haltenhoff expresses the opinion that it is likely that the two diseases, keratitis dentritica and herpes cornea, are separate and distinct.

Dr. Dunn, (8) of Richmond, Va., has reported a case of keratitis dentritica, associated with herpes zoster of the eyelids, in the Annals of Ophthalmology and Otology for April of this year, with a drawing of which Fig. 3 is a copy. In the same number of the Annals is a report of two cases of the so-called keratitis dentritica by Dr. Morton, of Minneapolis, whose cases were evidently of a mycotic type, as they yielded to local, antiseptic treatment. Studied from an unbiased standpoint I am led to conclude, that while the above types of superficial ulcers have many symptoms in common, they are separate diseases, excited by different causes and require different treatment. The mycotic yield promptly to local antiseptic treatment. The herpetic require constitutional in addition to local treatment. The malarial type will not improve without anti-malarial treatment, as well as local applications.

The following report of a case under this heading is of interest on account of the malarial history, though twenty years has elapsed since the disease was contracted.

F. G. W., male, aged forty-six, born in Germany. Family history unimportant. Denies having had venereal disease; partakes of light drinks; had an attack of influenza one month ago. Has had several attacks of acute inflammatory rheumatism during the past three years. Is subject to facial neuralgia. About twenty years ago he had a severe attack of malarial fever. *Status presens*, V. R.: R. 6-21; L. 6-6. R. E. There is some œdema of the lids. The ocular and palpebral conjunctiva is very much congested. Eyeball is tender to the touch. Cornea is slightly hazy. There is a superficial ulcer in the lower outer

quadrant of the cornea, extending eight millimeters along the margin and three millimeters inward as shown in Fig. 4. Having a history of inflammatory rheumatism, neuralgia and a recent attack of influenza, I ordered sodium salicylate and acetanilide in ten grain doses every four hours. Locally, cocaine, homatrophine and aristol were applied. On the following morning the patient reported free from pain and of having had his first good night's rest for a month. Less congestion and tenderness of the eye; four per cent. solution of cocaine instilled and aristol applied to the ulcer.

December 1st. Patient had four attacks of pain in the eye and right side of the head, since midnight. The eye, however, looks better. Aristol applied to the ulcer. Applied cantharidal collodion to the right temple. Ordered one-eighth grain of sulphate morphine, and one minim of fluid extract aconite to be taken every two hours if needed to relieve the pain.

December 2nd. Pain returned at 5 o'clock yesterday afternoon, and continued until three o'clock this morning. Cornea is clearer.

December 7th. The eye has been dressed daily with cocaine and aristol. Hot water dressings for half an hour every alternate hour. Internally one-twentieth of a grain of the bichloride of mercury six times daily, instead of the salicylate. An attack of pain yesterday was only partially relieved by four one-fourth grain tablets of sulphate morphine taken within six hours Hot fomentations gave temporary relief. The cornea is clearer, yet the ulcer is somewhat deeper. Being reminded of the effects of malaria, I ordered three grains of sulphate of quinine, to be taken every four hours, the evening dose to be six grains.

December 10th. Patient has been free from pain since commencing the quinine; there is less congestion of the eye ball. Tension is normal. V. R. 6-12. The epithelial layer of the cornea is reforming and the ulcer is smaller. Under cocaine the ulcer was touched with pure carbolic acid on cotton; the cotton was deprived of an excess of acid by compressing it between layers of dry cotton.

December 19th. There has been no pain excepting a slight attack on the afternoon of the sixteenth. There is now but

slight ocular congestion. No tenderness of the eyeball. The ulcer has healed, leaving but a slight opacity. V. R. 6-6.

Fig. (5) shows it as it appeared December 12th.

On February 21, 1893, patient called to see me while on a visit to the city, his home being in Saratoga, Wyoming. An examination failed to reveal any evidence of the eye having been diseased. Vision 6-6.

We are all, unfortunately, too familiar with the deep ulcer and its destructive work. It frequently is the result of an infected corneal wound, one of the most destructive of which is a wound infected from an old, dacryo-cystitis. The deep ulcer, as already alluded to, is sometimes the sequela of neglected or improper treatment of a phlyctenular ulcer. They at times develop during an attack of purulent conjunctivitis and the severe forms of exanthemata.

An ulcer developing in the course of purulent ophthalmia is a grave complication. And when a gray infiltration makes its appearance in the center of the cornea, during the active stage of the ophthalmia it is quite certain to melt away.

The serpignious ulcer which commonly develops in the old and feeble, is sometimes very destructive. Beginning at the corneal margin, as perhaps a slight gray spot, it spreads towards the centre, increasing in depth, the inner border being sharply defined, while the outer is filling up. Unless the ulcerative process is checked it soon perforates the cornea, and becomes complicated with inflammation of the deeper structures. Hypopyon, or pus, in the anterior chamber is likely to appear before the perforation takes place. Fig. (6) illustrates this type of ulcer with hypopyon.

The crescentic ulcer forming a deep furrow around the margin of the cornea, is occasionally met with in the debilitated. If neglected, it will extend around the cornea and cut off its nutrition. Being of a mycotic type, its progress can be checked by antiseptic applications.

Fig. (7) illustrates a case of this type, that one application of carbolic acid, followed by daily instillations of warm solution of chlorate of potassium effected a cure in about ten days.

In the treatment of corneal ulcers we aim at helping nature, by relieving the pain, and checking the destructive process. In some, the exciting cause is local, while in others it is constitutional. Some are very painful, especially if they are superficial. Others, being deep and very destructive, are at times almost painless. The first indication is to place the eye at rest. In young subjects the accommodation should be paralzed with atrophine, and, in all cases, excepting perhaps the superficial phlyctenular ulcer, a protecting compress should be worn to aid in keeping the eye quiet, and prevent friction of the lids. The compress may be held in place by a bandage, adhesive strips, or with a pair of coquilles.

The application of hot water for ten or twenty minutes, every one or two hours, aids very materially in relieving the pain and congestion. The hot water can be applied to the closed lids and brow, or applied direct to the ulcer with the aid of a dropper. When using the latter method, I order five grains of chloride of potassium to the ounce of water. Dr. Lippincott, of Pittsburgh, has reported excellent results from dropping water at the temperature of 150 deg., directly on the affected area. (10)

In persons beyond twenty-five years of age, atropine should be used in weak solution. At the same time, eserine may be used with advantage, in one-fourth to one-half grain solution. The eserine contracts the vessels, relieves the congestion, tension and pain.

Locally to the ulcer, we have a choice of several well-tried and faithful remedies. They are: boric acid, aristol, ointment of the yellow oxide of mercury, ten-grain solution of nitrate of silver, (11) liquid carbolic acid, (12) scraping, actual (14) and the galvano cautery. After cleansing the ulcer of the detritus under cocaine, the application of dry boric acid, aristol, the yellow ointment, ten-grain solution of nitrate of silver, or the liquid carbolic acid, will do excellent service, in the superficial and moderately deep ulcer. In the deep and rapid ulcers, the actual cautery, or galvano-cautery, are the most reliable for destroying the unhealthy tissue and stimulating healing. When dacryo-cystitis exists, which, according to Noyes (15), is the

cause of infection in from twenty to thirty-two per cent. of the cases, ulcus serpens; it is essential that the sac be freely irrigated with an antiseptic solution, such as the bichloride of mercury, 1 to 5,000, once or twice daily, or at each dressing of the ulcer. In cases where perforation is threatened and pus has been deposited in the anterior chamber, paracentesis should be performed to relieve the tension and evacuate the pus.

Constitutional treatment is indicated in nearly all cases of corneal ulceration. The feeble and strumous should receive plain nourishing food, with tonics and cod-liver oil. Where there is a malarial history, quinine or arsenic should be administered.

(1) Noyes, Text Book on Diseases of the Eye: 1890. p. 698.
(2) Trans. Am. Ophthal. Soc. Vol. III, p. 91.
(3) Am. Journal Med. Sciences, 1881.
(4) The Chicago Med. Journal and Ex. December, 1881.
(5) Trans. Am. Ophthal. Soc. Vol. V, p. 331.
(6) Trans. Am. Ophthal. Soc. Vol. III, p. 93.
(7) Ophthalmic Review. Vol. XI, p. 269.
(8) Annals of Oph. and Otol. Vol. II, p. 139.
(9) Annals of Oph. and Otol. Vol. II, p. 168.
(10) Ophthalmic Review. Vol. XI, p. 777.
(11) Trans. Am. Oph. Soc. Vol. V, p. 133.
(12) Report of the Fourth International Ophthalmic Congress. (London, 1873, p. 102.)
(13) Trans. of the Med. Soc. of Pa. Vol. XXI, p. 220.
(14) Trans. of the Phila. Co. Med. Assoc. February, 1891.
(15) Noyes' Text Book on Diseases of the Eye, 1890, p. 366.

DISCUSSION.

Dr. John Chase.—I wish to commend what the doctor says about the use of boracic soda in ulcers of the cornea.

The only criticism I should make on his remarks, would be perhaps the use of a compress bandage; I did use it four or five years ago, but do not use it now, except where it is for the comfort of the patient. I believe the cure of ulceration, can be accomplished better without a bandage, than with one.

I wish to call attention to the treatment of leucoma, a result of ulceration of the cornea. I have found very good results following the daily application of a weak faradic current directly to the leucoma. I had a recent case of this kind, where the patient lost his left eye completely, and the right one suffered ulceration. Of course I was obliged to make a Saemirch operation, and for a time despaired of the eye. The cornea finally recovered with a dense leucoma, leaving vision only 3-200. I put him under a weak faradic current for three months, and then advised him to quit and with marked improvement. He persisted and now has been undergoing treatment for nine months, and if any of you care to see him, he is willing to submit his eye to you for examination. He has been working at a trade now for six months, and the leucoma is passing off the center of the cornea, which is a very good result.

ADDRESS IN MEDICINE.

W. J. Rothwell, M.D., Denver.

Medicine is a plant of slow growth. It has been watered by the sweat and tears of many of the wisest and best of men, and yet its roots have been slow in penetrating to the deep soil of truth and its fruit often drops immature from among its clustered leaves.

Medical theories, like the seasons, have their vicissitudes. When physiology made known the regulating and controlling power of the nervous system over the body, disease was thought to be for the most part of nervous origin. When chemistry proved that all tissue change is analytical or synthetical the chemico-vital theory prevailed.

Now that the microscope is opening to our vision myriads of animal and vegetable organisms, both in the air and in unhealthy organs of the body, these germs are considered to be the real morbific agents, the harbingers of disease and death.

Notwithstanding the changing currents of scientific thought, it is consoling to reflect that each leaves a trace which future explorers can more readily follow to the realm of truth. So we "doubt not through the ages one increasing purpose runs, and the thoughts of men are widened by the progress of the suns."

The former methods of investigating disease are to a great extent responsible for the diversity of opinions as to its nature and origin. Physicians have been too much inclined to cudgel their own brains for an explanation of the phenomena of disease, and consequently the answers returned have been as varied as were the degrees of intelligence and experience of the questioners. Fortunately, the method now in vogue is to put the question to the phenomenon itself, to inquire into its antecedants and consequents, its causes and effects, and the elements which constitute it. This is indeed a slow and difficult path to tread, and its good is often the Temple of Silence.

It is, however, the pathway of science which must in the very nature of things lead us to all truth. The pressing need of the times is men of means and ability who will persistently and silently devote their lives to the solution of the unsolved problems of pathology and therapeutics, I emphasize the word *silently*. This seems to be an age in which the physician is encouraged to print his thoughts for the benefit of his fellow-workers, and the profession has responded with a hearty good will. The volume of literature flowing from our presses overwhelms us. We can scarcely keep afloat on its surging waters.

As I have neither the time nor the inclination to traverse with you the wide domain of medicine, I wish to indulge in some reflections which are intended to answer the question of "The etiology and early diagnosis of pulmonary tuberculosis."

Not long ago Professor Koch announced his discovery of tuberculin. This deadly ptomaine formed by the agency of the tubercle bacillus itself, was to cure tuberculosis by killing the bacilli in the diseased organs. This is a thoroughly scientific method of cure, if the domiciliation of these germs in the lungs

is the *fons et origo* of the disease. But is this true? We know that most of our authorities say it is so, but the laws of nature are not governed by authorities.

These laws teach us that animals and vegetables live and multiply only in a suitable soil and climate. It is not claimed that these vegetable spores form any exceptions to this general rule. We know that in the human body this soil does not consist of healthy, highly animalized cells, for if normal, vigorous cells could in any way become the food of the parasites, man could not exist on the earth. A normal cell is a phagocyte, a germ devourer, not food for a germ. It is the imperfectly nourished cells, whose potential energy is exhausted, whose vitality is impaired, which supply food and shelter to these scavengers of creation. If these observations are true, and I believe they are, there must be an abnormal state of the system which precedes and determines the lodgement of the tubercle-bacilli in the lungs. Does the presence of these bacteria in the pulmonary organs correct this systemic defect? Does it not, on the contrary, greatly aggravate it? If the diathesis persists in an aggravated degree after the domiciliation of the bacilli in the lungs, to what extent is the patient protected from a second colonization, even if it were possible to destroy the original settlement by tuberculin or any other germicide? The only truthful reply which can be made is that he is not at all protected, but is even more predisposed than before. And yet Von Ziemssen and many others tell us that "destruction of the bacilli must be the goal of all our therapeutic endeavors. Should we not say, it must be a goal, but not *the* goal.

It is an old Hipprocratic maxim that "the method of cure reveals the nature of the disease." For the last few years our chief aim in pulmonary therapeusis has been germ destruction. Can we make the unqualified statement that the results have been such as to command it above all other measures? It will be interesting in this connection to call the roll of specifics which have flourished for a time, and then vanished away. Antiseptic inhalations of carbolic acid, creasote, iodine, eucalyptol, iodoform, hydrofluoric acid, turpentine, sulphurous acid, chlorine, sulphuretted hydrogen; rectal injections of sul-

phuretted hydrogen, intro-pulmonary injections of iodoform, creasote, carbolic acid naphthol, camphor, quaiacol; Liebrich's injections of cantharadinate of potash, etc.

The conclusion to be drawn from the futility of all these remedies is that their germicidal action is not sufficiently powerful, or that germ destruction is not the main indication in the treatment of pulmonary phthisis, But I would ask, has any one lost confidence in sun-light, pure air, exercise adapted to the stage of the disease, climatic influences, and the use of such medicinal agents as tend to enforce the vital energies? The bacillus of tubercle can hardly be considered infectious, in the common acceptation of the term. It is present almost everywhere in the large cities and towns. One bacteriologist finds it in the dust of the streets, another in the scrapings from the walls of railway coaches. It has been found on the down of grapes, on the leaves of house plants, and Dr. Hoffman, of Dresden, has discovered it even in the excrement of house-flies.

Were the special poisons of diphtheria, scarlatina, or variola, as widely distributed as this, those diseases would be pandemic. Statistics show that the nurses, resident and visiting physicians in large hospitals do not present a higher death rate from phthisis than other citizens, if due attention be paid to hygiene. According to the reports of Dr. Williams, of Brompton Hospital, the largest hospital for phthisis in the world, the physicians, nurses and officers of that institution are not more frequently attacked by tuberculosis than the inhabitants of populous cities, despite poor ventilation, imperfect cleaning of cuspadores, etc. In the history of that great hospital only a few cases could in any way be attributed to infection.

Among the inmates of prisons, houses of detention, cloisters, etc., the death rate is much higher, although from the very fact of their confinement they are less exposed to infectious germs than ordinary citizens. Persons in close seclusion often escape other germ diseases, such as influenza, by reason of their living less exposed to the *materies morbi*. Here, on the contrary, it seems that the less the exposure the more certain is the contagion. The truth is, however, that in prison life are found those physical and psychical factors which impair the resisting

power of the cells and tissues and bring about a condition of depraved nutrition, the constant precursor of phthisis.

These agencies are sedentary habits, inhaling air poor in oxygen, and rich in carbonic acid, poor food, mental depression, remorse, etc.

While the general mortality from phthisis is estimated at from fourteen to fifteen per cent. of the total mortality in prisons, one-half the inmates die of tuberculosis. The more rigid the seclusion the higher the death rate, and vice versa. Under the strict prison disclipine of Russia and Austria sixty-one per cent. die of pulmonary phthisis; under the humane system in this country it is much lower.

It is evident, then, that of the vast number of nurses and doctors who attended the wards of Brompton Hospital but a very few were in a condition to be injured by the countless bacteria which swarmed around them, while the poorly nourished, hypotrophic inmates of the dungeons of Europe welcome them to their bosom, and find death in their infecting sting.

What is the essence of this condition? It is a defect in the construction or tissue-building powers of the system, resulting in the formation of degraded cells of low vitality and little resisting power, unable to do battle against the bacterial foe. This state Dr. Solomon Solis-Cohen calls hypotrophy, and after enumerating the various ways in which it may be developed makes this bold statement:

"I hold, though, that hypotrophy, congenital or acquired, is the starting point of the various morbid processes now, for want of a better knowledge, indiscriminately called tuberculosis; and that the bacillus of Koch, while perhaps the most important of the several microbes that influence the progress of the lesions in various forms of the disease, does not of itself originate the disease in any form.

Dr. T. Lauder Brunton in writing of the action of bacteria and their products on the body, says, when they are injected they produce different effects according to their original nature and the quantity introduced. There is, says he, probably another factor of no less importance which, however, still requires to be investigated, viz., the condition of the body into which

they are introduced. The reaction is between the body and the virus introduced. The same drug or virus entering the same body under different conditions produces different reactions. If the state of the body is an important factor in determining the effects produced by the injection of bacteria into it, it is no less important in deciding their fate when they enter by the natural avenues. The condition of the body is the most important factor. A perfectly sound man is proof against infection.

When young in the profession I had much confidence in physical diagnosis as a means of detecting the incipient stage of phthisis. Experience and observation have robbed me of that confidence and convinced me that it is not safe to place implicit faith in this method. We can no doubt, detect slight dullness on percussion, prolonged expiration, fine crepitation, wavy respiration, etc. But are these physical signs present in the initial stage of the disease? They are certainly absent in the pre-bacillary stage, nor can they be detected after bacterial infection, till the disease has progressed to a dangerous stage. How seldom do our patients recover after we find by physical signs unequivocal evidence of phthisis! The following from Dr. Horace Dobill is worthy of quotation: "The absence of reliable signs of the earliest stage of tubercular deposit, cannot be too forcibly impressed upon the young practicioner, who, with commendable zeal is to apt too think and prone to hope that by sufficient diligence, experience and care, he may be certain that no tubercle shall escape his searching examination. This is the great disappointment which everyone has to encounter, who studies and practises physical diagnosis. That upon which he had set his heart, to detect the first shadow of consumption scarce yet resting on a life, before it is too late to drive it back, is the very dream which experience will be sure to dissipate."

We do not wish to deny the great value of physical diagnosis in estimating the stage and progress of the disease, but to emphasize the fact that the malady has a strong hold on the patient before sufficient organic change has occurred to be detectable by the most skilful diagnostician.

But, it may be asked, have we not a certain and reliable diagnostic test in the bacillus of Koch? Unfortunately this question must be answered in the negative. Their presence in the sputum is positive proof of bacillary consumption; but their absence is by no means to be relied upon in excluding the disease. And why? Because they cannot be detected before the breaking down of the tissue in which they are domiciled opens a way of exit for them. They are encapsulated in the reaction tissue which has been thrown around them, and thus elude our most careful examinations.

In an article in Wood's Medical and Surgical Monographs, Von Ziemssen admits that he has not been able to find the bacilli in acute miliary tuberculosis, the most fatal of all forms of the disease.

The presence of elastic fibers in the sputum is dependent upon destructive process in the pulmonary tissue. Dr. Peter Kantzer states where elastic fibres exist, the bacilli of Koch are also present. The breaking down of the tissue supplies the elastic fibres and liberates the bacilli. Their presence is positive, but their absence is not negative.

What shall we think of the diagnostic value of tuberculin? We need just such a pathological reagent as the friends of tuberculin say it is. An agent, which being introduced into the system would cause a peculiar reaction, and that only in the presence of Koch's bacilli. Its importance cannot be overestimated. While many have pronounced against its diagnostic value, it has many warm advocates. According to the New York Medical Journal of the 10th inst., Dr. Charles Denison of this city uses tuberculin as a means of diagnostic confirmation of tuberculosis where there is no sputum or there are no bacili in the sputum. The question is still *sub-judice.*

In conclusion, I wish to emphasize the statements that practical medicine is always most successful under the guidance of educated common sense; that scientific medicine, though the idol of our hearts often leads us to forget the patient in our zeal to conquer the disease; that if we desire to be of the greatest possible benefit to our weak-lunged patients, we

must carefully study the characteristics of the pre-bacillary stage in phthis, and employ every hygienic and medicinal means of fortifying the system against infection, and like prudent generals strengthen the coast defence so that the enemy cannot penetrate into the country.

DISCUSSION.

DR. LEMOND.—I wish to thank Dr. Rothwell for his able paper. Those of us who know Dr. Rothwell best, know his worth in scientific medicine. I think with scientific research by such men as Dr Rothwell has indicated in his paper, we will soon reach the nucleus of habitation of this microbe or bacillus that destroys the lung tissue. It has in all ages, since the civilization of man, been one of the worst conditions that the flesh has been heir to. Even the name "consumption" or "tuberculosis" is alone enough to strike terror to the intelligent individual.

I think with honest investigation by men of scientific methods that the time is coming when we will break off or set aside almost all of the severities of this trouble. Even now it can be controlled in its incipiency, and I dare say that in the near future this dreaded disease, by preventive measures, will be wiped out of existence, or its ravages almost entirely controlled.

I wish that my investigations in this direction had been carried to a greater degree than I have had the opportunity of doing (I being in a different department of medicine). Nevertheless I like to hear able papers like this, and it does me good to see that we have men among us that are going into immense resource for knowledge, and hunting out and turning over the fallow ground of this deep rooted and dreaded disease.

DR. GILDEA.—I wish to mention a case just to illustrate Dr. Rothwell's paper. I know a young man who started in New York City to study medicine. He lived well, and in spite of a hard course in college he did not acquire tuberculosis; he went to a hospital where he worked for about two years among tuberculosis patients and still did not acquire it. After this he went abroad to complete his studies in London and Paris, and

when in Paris he slept for some time in a room where there was little sunlight and poor ventilation; from there he went to Vienna where he didn't pay much attention to his surroundings or food, studied hard, and as a result of this, in six months had a hemmorrhage.

This case proves to my mind, that in spite of the fact that he was exposed to the disease for several years, he did not acquire tuberculosis, but as soon as he let his system run down, he acquired it under circumstances which would otherwise prove innocuous.

DR. M. HARRISON (Aspen).—I was very much struck with the doctor's article, particularly that portion of it referring to sunlight and air as being the best agents to surround a subject laboring under a trouble of this character. There is quite a diversity of opinion among medical men upon nearly all topics; but there is probably a wider difference of opinion upon this subject than anything else of recent date.

I believe that we have endeavored to house and clothe our tuberculosis patients too much. My experience has proved to me, that instead of directing a tuberculosis patient to wear fleece-lined flannels, or heavy flannels, it would be better to suggest light under-clothing. My idea for this is, that the heavy garment suppresses the action of the capillary system. I know that this is not in accord with the popular opinion of medical men.

I live where it is colder than it is here, where we have a good deal of sunshine, and have winter weather for several months in the year. In my experience with tuberculous patients for the last six years I have endeavored to restrain them from going out sleigh-riding, taking long drives or going horse-back riding, or going out of doors even, unless clothed with the very best underwear that could be provided for them; while on the other hand I have noticed that others who were equally as bad off, and some of them that were worse, not acting under these directions so rigidly, have done decidedly better, and therefore this particular point presented itself to me.

I would like to hear more from the doctors on this subject and more particularly from Dr. Rothwell.

DR. ROTHWELL.—I was not expecting any discussion on my address, and am not prepared to say much in reply to the gentlemen. The main idea I intended to bring out in the paper was that all are endowed with a certain amount of potential energy at birth. That as long as this stock is carefully preserved, we are proof against bacterial infection. It is only when we allow our systems to run down and the energy of the cells to be weakened, that these organisms can take hold of us; then the bacilli of Koch and all other bacteria find a ready home in our systems.

The chief aim in the treatment of tuberculosis is the invigoration of the system, thereby increasing its resisting power. The most important service that physicians can render to their patients and the public at large, is to teach them how to avoid becoming so weakened as to be attacked by these forms of disease. I wanted also to impress the importance of an early diagnosis of the disease, and the great difficulty of making such a diagnosis. We should not wait until we can make it by physical signs, but commence the treatment in the pre-bacilliary stage.

I wanted to make another strong point, and that was against the prevalence of attacking the patient by every possible means in order to destroy the bacilli in the lungs. We generally do him more injury than we do the bacilli. If we build up the system to resist these germs, we know that we are on safe ground and that we are doing good.

COLD IN PYREXIA AND ESPECIALLY IN TYPHOID FEVER.

H. W. MCLAUTHLIN, M.D., DENVER.

Fever, in varying degrees is an important symptom of a host of diseases and is accountable for much of the discomfort and danger attending them. Dr. H. C. Wood says: "External

heat applied to the body of the normal animal, so as to elevate the temperature, produces derangement of the nerve function, of circulation, etc., precisely similar to those seen in natural fever, the intensity of the disturbance being directly proportionate to the rise of temperature."

"Heat applied locally to the brain or heart produces in the functions of these organs the disturbances which are familiar phenomena of fever, the intensity of the disturbances being directly proportionate to the extent of heat in the organ."

"The withdrawal of the excessive heat in fever is followed by a relief of the nervous and circulatory disturbances." As an illustration to this last statement Wood says: "I have placed a man whose temperature was nearly 110 deg. Fahr., who was unconscious, with a feeble, running pulse of 160 to 170, irregular, jerking, slow respiration, and every indication of immediate death, in a bath of 60 deg. Fahr. and within a minute and a half have seen consciousness partially restored, and in another minute and a half the man trying to get out of the bath. What could the bath do to affect the man so profoundly and so quickly but withdraw the heat? That the heat was present and that it was withdrawn the thermometer proved. If the drowsiness had been due to simple congestion of the brain, very certainly would the bath, by driving the blood from the surface, have increased the trouble."

But it seems to me another equally or more importantfactor must be taken into account in explaining the symptoms of diseases attended by considerable fever, viz., a toxæmia which the disease has induced and which is overwhelming the nervous system and imparing the functions of the organs dependant upon it, thus affecting digestion, respiration, the heart action and the secretions.

This is illustrated by those somewhat rare cases of typhoid fever attended with little or even a subnormal tempature. It is very generally admitted that cases proven to be typhoid by the presence of the classical symptoms of the disease, exclusive of marked fever, are not only occasionally met with, but that such cases are at times fatal. Profound nervous symptoms in such cases cannot be ascribed to the effects of

pyrexia and can only be explained by the toxæmia induced by the poison of the disease.

Indeed Naunyn goes to the extent of denying that the effect of cold in pyrexia is at all due to the withdrawing of heat. He claims to have demonstrated by his experiments that by keeping up a proper ventilation and carefully giving food and water he could gradually heat rabbits up to a temperature of 107 and 108, and could sustain this temperature steadily for weeks without their showing any discomfort from it, and without causing any organic lesions. From his experiments he strongly advocates the use of cold baths in fever, but believes their good results are due to their incidentally reducing bodily waste and increasing renal secretion, strengthening the pulse and stimulating the nerve centers. Wood also admits that the advantage gained from the cold bath may be due to a reflex action on the nerve centers and is not solely due to the loss of heat. Dr. Simon Baruch, who now stands in the fore front in America in advocating hydrotherapeutics, says: "It is not the cooling of the surface and thereby the cooling of the whole body, but the stimulus following the shock, due to impingment of cold upon the cutaneous nerves,which is conveyed to the central nervous system and thence reflected to every organ over which it presides. The cooling effect is the most palpable to the eye; it is demonstrated by the thermometer; but if this were the chief aim of fever therapy it would be far more perfectly reached by the coal tar antipyretics." Dr, A. Jacobi says: "The habit of depressing temperature in all cases which exhibit a temperature of 103 or thereabouts is bad. It is not the temperature that is injurious, but the absence or insufficiency of resistance, the tissues offer to its effect."

Just here it seems to me is a strong bulwark in favor of cold in pyrexia, namely, that nearly all experimenters and observers agree as to its power, and when judiciously used its value, although they may differ as to how it accomplishes the good. Wood summarizes the results of the physiological study of the effects of cold in fever as follows: "During a sufficiently prolonged application of cold the bodily temperature falls, although an increased production of heat, *i. e.*, consumption of

tissue, at first occurs. After the application the bodily temperature continues to fall or but slowly regains its former position. The present evidence at our disposal indicates, but it is not sufficient to prove, that this slow regaining of bodily temperature is due to a diminished production of animal heat; that is, to a decrease in the waste of tissue, and in the formation of urea and carbonic acid. Dr. W. H. Draper in a paper on Hydrotherapy read before the New York Academy of Medicine and recently published in the Medical Record, says: "The physiological effects of the cold bath vary with the degree of the temperature below body heat, but these effects cannot be said to be marked unless the temperature of the water is at least 10 to 15 deg. Fahr. below that of the blood; they increase rapidly below these temperatures. The immediate effects are a contraction of the cutaneous vessels, and an exaltation of the spinal reflex as manifested by shivering. If the emersion is long continued there is a more or less marked lowering of blood temperature, a rapidly increasing frequency and feebleness of the heart's action, an accumulation of blood in the systemic veins, and, if further protracted, the usual signs of asphyxia and collapse ensue. The reaction from the cold bath, which is the affect sought in its therapeutic use, is a sudden dilation of the cutaneous vessels, stimulation of the heart action, a rapid re-establishment of the equilibrium of the circulation, and a restoration of body heat. Where the cold bath is used for the abstraction of heat, as in case of hyperpyrexia, the effects of the reaction are most striking. They are manifested by the partial return of consciousness, by the subsidence of delirium, the diminished reflex excitability of the spinal cord and the strengthening of the heart action. It is true that these effects are coincident with the lowering of the blood temperature, but it seems probable that they are partly due to the powerful impression made by the cold bath upon the peripheral nervous distribution."

The therapeutic value of cold is no modern discovery. Hippocrates wrote a book on it. Galen described the use of cold in pyrexia in a way which could be adopted safely and profitably to day. Currie, of Liverpool, in the latter part

of the last century reintroduced the treatment of fever by cold. In late years the Germans have adopted the method quite generally, and Brand, of Stetten, has forced the world to observe and ponder his statistics of typhoid fever treated by the full bath system called after his name.

Of the various methods of applying cold in pyrexia, William Pepper in his Theory and Practice of Medicine, 1893, says under treatment of typhoid: "There are various methods which vary in their efficiency and value, including repeated spongings of the surface, the cold water pack, cold effusion, Leiters tubes, the graduated bath and the strict Brand method of cold water bathing. In mild, and even in ordinary cases sponging the entire surface of the body with cold water as often as the temperature in the mouth reaches 102 deg. Fahr. is distinctly valuable. A little vinegar or alcohol may be added to the water which may be cold (50-70 deg.) or cool (70 to 80 deg.) according to the greater or less degree of fever; and the sponging may be kept up for ten minutes or more and be repeated as often as every two hours. Friction and gentle kneading of the surface should be combined with it. The temperature may be temporarily reduced from 1 deg. to 1½ deg. Fahr. in this way. As a rule it promptly rises again, but the process is agreeable and not fatiguing to the patient. A thin rubber bag or bladder filled with cracked ice may be applied to the head at the same time." Even when the fever is not high but nervous excitement is marked, this may be used with good effe ct.

The cold pack is a much more powerful antipyretic and is applicable even when the temperature reaches 104 or 105 deg. The bed should be protected by a rubber cloth, and the patient with his body clothing removed, wrapped in a sheet wet with cold water. The surface is then briskly rubbed through the sheet, and from time to time cold water is sprinkled over the sheet so that it shall be, kept wet and cold. By using ice water, even hyperpyrexia 104 deg. or above, may be dealt with effectually in this way, but the process is tedious and troublesome. The recommendation to use friction must not

be overlooked, any of these methods are inferior to the cold bath in certainty ofaction and durability of effect.

In the graduated bath the patient is placed in water of about 90 deg. Fahr., which is then cooled to 70 or even lower. This form of bath must be continued longer and its results are less reliable than when the water is cold from the start. It has the advantage that the shock to the patient is not so great; it is therefore especially suited to children and to the aged and to persons greatly debilitated." It was originated by Dr. Von Ziemssen, of cyclopedia fame, as a modification of the Brand bath and as being better adopted to private practice.

All of these methods of applying cold externally are useful and have their respective places, but from none of them can such results be obtained as from the systematic use of cold baths in precise accordance with the method advocated by Brand. This veteran in hydrotherapy recommends the employment of general cold baths, with friction whenever the temperature of the patient reaches a certain elevation. A large bath-tub moavable on rollers, is kept half full of water 65 to 70 deg. Fahr., and is rolled to the edge of the bed when needed. As often as the temperature, taken every three hours in the mouth or rectum, is 102.2, the patient receives a bath lasting 15 to 20 minutes." Dr. Baruch in Hare's System of Practical Therapeutics gives a comprehensive description of the Brand bath.

"Before the patient is placed in a cold bath a stimulant (½-2 oz., of brandy) may be administered. The sexual organs are lightly covered by a napkin, the face and chest are laved with ice water, after which he is gently placed in the water. The shock of the cold submersion may cause the patient to declare that he cannot breathe, or it may produce trembling. Usually if the temperature is below 70 deg., he will remonstrate with his attendants that he is very cold and that he cannot bear it, but patience and avoidance of flurry or excitement, firmness in insisting that no harm shall befall him and extreme gentleness will overcome his objections. It would be well to avoid sympathetic bystanders, who will by the expression on their faces

or by actual remonstrance defeat the proper execution of the proceedure. The latter requires the courage of conviction derived from actual practice or careful investigation, so great is the temptation to obey the importunities of the patient and his friends. After the patient is submerged one or two persons should gently pass the flattened outstretched hands over successive parts of the body. By these frictions, as Brand has shown, the superficial vessels are dilated, and because of the reaction induced by it, the skin, which was of a dead white when the patient entered the bath, becomes of a ruddy hue under the hands. It may become cyanotic if friction does not actively counteract the contraction of the arterioles produced by the cold impact. The patient must not be removed until the alloted time has expired. The best guide to the safety of the bath is the patient's condition. If he complains of being chilly and shivers, he must not be removed until chattering of the teeth confirms the statement. Cyanosis of the lips or face is an immediate sign for removing the patient to his blanket. Many physicians are deterred from continuing the baths sufficiently long (15 minutes according to Brand) when the pulse becomes small and steady. But this is due to the local effect of the cold upon the radial arteries. Unless the thready pulse is accompanied by an increased number of beats, danger from collapse is not present. Friction over the body and limbs should never cease during the bath. When 15 minutes have expired, or the patient's condition demands it, he must be gently lifted by two persons and be held suspended for a minute over the tub while the water drains off and the napkin over the genitals is removed. He is now laid upon the sheet and quickly dried from head to foot. If the temperature has been above 103 deg. he is covered with a blanket and dried in five minutes, if below 103 deg. he is dried with the sheet and towels, his gown replaced and he is covered with the bed clothes, hot water being applied to the extremeties. At this point nourishment is most readily administered." Osler says of the Brand bath in typhoid fever: "The only contra-indications are peritonitis and hemmorrhage, neither bronchitis nor pneumonia being so regarded. The good effects of the bath are, (1) reduction of fever, (2)

the intellect becomes clearer, the stupor lessens and the muscular twitchings disappear, (3) a generally tonic action particularly on the heart, (4) insomnia is lessened, the patient usually falling asleep for two or three hours after each bath, and (5), most important of all, the mortality under this plan of treatment is reduced to a minimum." Yet after marshalling this strong support in favor of the Brand bath in typhoid fever, Osler says, that personally he sympathizes with those who call the method barbarous, that many patients complain of it severely and that in private practice it is hardly feasible. Both Osler and H. C. Wood favor the graduated bath in private practice.

The statistics showing the result of the cold water treatment of typhoid are fast becoming overwhelming. Dr. Brand has collected 19,017 cases of typhus and typhoid fever in which the treatment was carried out more or less effectually, showing a mortality of 7.8 per cent. He has made another series of 5,573 cases treated by a believer (hence carried out better probably) with a mortality of 3.9 per cent.

Prof. Liebermeister is said to have had more experience with this treatment than any other man. According to Wood, Liebermeister, at the hospital of Basel, up to 1865, had treated or caused to be treated 1,718 cases of typhoid on the expectant treatment with a mortality of 27.3 per cent. In 1865 he began in a timid way the cold bath treatment. 982 cases gave a mortality of 16.2 per cent. In 1866 he began the vigorous use of the Brand method, treating 1,121 cases with a mortality of 8.2 per cent.

Among American physicians Dr. J. C. Wilson, of Philadelphia, has been an earnest advocate of the Brand bath in typhoid and has employed it exclusively in the German Hospital of that city. One hundred and sixty cases were treated in sixteen months with a mortality of five per cent.

In speaking of the backwardness of the medical profession in America to employ the method, Wood says: "I have no doubt that many persons have died in the United States of typhoid fever, whose lives would have been saved if the Ameri-

can medical profession had risen above the opposition of the laity and its own prejudice."

Dr. Hare, of Australia, reports 797 cases with a mortality of seven per cent. Brand's latest statistics show 1,223 cases treated according to his method by himself and a few other physicians; twelve deaths occurred, a *mortality of one per cent.* All the fatal cases failed to come under treatment until after the fifth day of the disease. Brand now, after thirty years' experience, claims that every case of typhoid fever will recover in which his method of treatment is commenced before the fifth day. It has been claimed that the Brand treatment of typhoid favors the occurrence of intestinal hemorrhage; also that relapses and severe complications are more common. Neither of these claims can be substantiated. Liebermeister shows 861 cases treated without cold baths with 8.4 per cent. having intestinal hemorrhage, while of 882 cases, using the bath, only 6.2 per cent. had hemorrhages. Neither menstruation nor pregnancy are beileved to contra-indicate this treatment. In reference to pneumonia and bronchitis Wood believes that when severe symptoms of these diseases arise in the beginning of typhoid the anti-pyretic treatment by cold should be employed very cautiously; but when occurring late in the disease and due to hypostasis rather than inflammation, the treatment is not contra-indicated. The Reference Hand Book, in the article on cold by Dr. James Stewart, states: "A very important contra-indication to the use of the cold bath is the existence of a weak heart. No matter whether this weakness is due to a previous organic change or to a present degeneration of the muscular fibres from the continuous high temperature. When the circulation is so depressed that the peripheral parts are cold, while the body temperature at the same time is high there exists no hope that a further cooling of the surface can influence the internal temperature to any extent. On the contrary the cooling will be the more apt to increase the paresis of the heart already present. In slight degrees of heart weakness the bath gradually cooled down is the appropriate treatment. Some patients withstand the influence of cold baths badly. After

every bath there is coldness of the extremeties. In these cases the baths should not be repeated." The length of the disease is unaffected apparently by the bath treatment.

Time will merely permit me to name some of the other febrile diseases in which the treatment by cold is authoritatively recommended. Typhus fever, cholera, the exanthemata, especially scarlet fever; also diphtheria and some forms of serous diarrhœa, pneumonia (sthenic) and the like. Indeed it is according to the best therapeutic authorities probable that systematic cold bathing will be found efficient in all blood poison conditions with high temperature, as small-pox, erysipelas, etc. Liebermeister has also used it in catarrhal pneumonia, puerpurel fever, cerebro-spinal-meningitis, acute rheumatism and quinsy. Dr. C. Theodore Williams has successfully treated the pyrexia of phthisis with cold.

In conclusion let me ask, is there not at this time a tendency to over drug in pyrexia with the coal tar antipyretics, on account of the ease with which they can be administered and of their positive results? They certainly make the patient more comfortable and reduce the temperature, but at the same time if given carelessly they enfeeble the heart and nerve centers, destroy the hæmoglobin of the blood and even life itself. There is reason to believe that there is peculiar danger from this class of drugs in fevers, if freely or continuously given. Finally are we not accepting too cautiously and using too sparingly the methods of men who have demonstrated that they speak with authority regarding the use of cold in pyrexia.

DISCUSSION.

Dr. Gildea.—I should like to make mention of nine cases of sunstroke treated by cold which occured in New York City in 1890.

Two cases were brought in almost dead, with the temperature at 110. In the other seven cases, the temperature ranged from 107 to 109. All of these patients were put into a bath of 50 deg. Fahr. six to eight ounces of blood was drawn from the arm, and the entire seven cases recovered without any bad symptoms. We kept them in the bath until the temperature

in the rectum was 103, we then took them out and surrounded them with hot blankets and bottles, and in spite of the external application of heat, the temperature ran down to 98 or 99 deg. Fahr. In less than 20 minutes from the time they were put into the bath unconscious, consciousness returned, and in less than two hours the temperature was in its normal condition.

None of the patients required more than ten days to make a complete recovery, and two of them went out in six days.

Dr. Whitney.—Statistics are frequently embarassing, because of the large number of conflicting opinions. The Brand bath is I know one of the customary methods of treatment, but I have had no experience in its use and I prefer as a rule, a milder treatment. Neither do I believe in the the indiscriminate use of the coal tar derivatives.

I have adopted recently in some few cases, the practice of giving very large quantities of ice water, in typhoid, directing that a pint of ice water be given if possible as often as every two hours. It seems to me that this is an excellent method of reducing temperature. We have also used the ice cage to some extent at the County Hospital. It is made like a large half barrel, open at both ends, and pails of ice kept constantly full, are hung along the ridge pole. The patient lies in the cage entirely uncovered, and it has been found by measurement that the temperature in the cage is several degrees lower than outside. Then again the constant circulation of air in the cage tends further to reduce the temperature of the patient. I think this should receive a trial since it is very easy of application in private practice.

One word more in regard to antipyretics in children. I think we should take to heart the advice of Henoch who says we should use cold with great caution. In those cases where it is used it should be applied most gradually, and one should remember that a cold bath, while it may under certain circumstances be a tonic for the heart, does on the whole increase temporarily the heart's labor since by contraction of the superficial capillaries it increases so much the force requisite for the continuance of the circulation.

DR. MUNN.—I desire to mention very briefly, a modification of the cold bath which I have found very valuable, especially in those cases of typhoid fever that are too weak to stand a full cold bath, and which is especially valuable in private practice where the patient's condition may permit of a cold bath, but where there are objections on the part of the relatives to this method of treatment; it is continuous irrigation of one or the other limbs. The whole circulation of blood passes in some six or eight minutes, I believe, through the whole body, and if the arm be kept in cold water, then the blood in the whole body will be somewhat lowered in temperature. Actual experience demonstrates that this proceedure does bring down the temperature almost as satisfactorily as a cold bath, and it is certainly a benefit if we can give the patient a cold bath without creating opposition in the family.

DR. MCLAUTHLIN.—There is nothing that I wish to add except to speak in defense (if defense is necessary) of statistics. It is very common when facts and figures are given which are not altogether believed, to say that they are "only statistics;" but after all what do we learn in medicine except from our own experience, and the experience of others, and is not that experience largely statistical?

It seems to me that one only has to read what is already published in the use of cold in pyrexia, to believe that the time is drawing near when cold will be used very generally for this purpose. Up to this time it is true it has been used by only a few, and so we can refuse if we wish to believe their statements and statistics. At the same time the tendency is this way, and I think we are often prevented through prejudice from carrying out the system correctly. The reason this subject was chosen was to bring to our minds a therapeutic measure which is made too little use of.

THE AVOIDANCE OF THE COMPLICATIONS OF TYPHOID FEVER.

By J. N. Hall, M.D., Denver.

Every one present must have been impressed, as I have been, with the fact that the great proportion of deaths from typhoid fever have resulted from some of the multitude of complications to which this disease is liable, rather than from the disease itself. I shall give some deductions which I have drawn from 129 cases of typhoid which I have seen in private practice in Colorado, and of which I have records. Of these, 12 were fatal, 10 of these from complications. One of the remaining two cases was that of a woman who developed typhoid before arising from childbed; and in the twelfth case alone, seen in consultation just before death, did it seem that the result was due to the excessive pyrexia. I use the term "complication" here to include all the various accidents to which typhoid patients are liable, although some of them, as, for instance, hemorrhage, are by some considered almost a part of the disease. It seems to me that some of us fail to watch carefully enough for the impending complications, which are much better avoided, when this is possible, than treated after they have developed.

No doubt some would say that the complications are found in the severe cases, and that the best method of avoiding them is to keep the temperature down. But this does not by any means cover the whole ground, for it is notorious that some of the worst complications develop without warning in walking cases. Thus a class-mate of mine died, as was shown by autopsy, of typhoidal perforation, when the disease had not been severe enough to cause him to consult a physician until two days before death, although attending medical lectures at the time. All have met with similar examples, no doubt. It has seemed to me that the lung complications of the disease rarely occur, excepting in the severer class of cases.

It should be noted that mention is made of the occurrence

of certain complications in a number of cases not corresponding to the number of fatal ones in making up the totals. The reason for this lies in the fact that the death in each case is attributed to the most important factor in bringing about this result, when more than one contributed toward it.

I feel confident that four of the deaths might have been avoided if the cases had been where they could have been thoroughly controlled by a physician, instead of at the mercy of injudicious friends in private families. One of them died from ingestion of two quarts of iced milk at one draught, during his convalescence from a complicating pleuro-pneumonia; severe pain and death following in three hours. The second died from the administration of a narcotic drug by an irregular physician, and this, though obviously avoidable, should not be charged to complications, strictly speaking. The third was abandoned as too sick to recover, by another irregular, and was found several days after, with immense bedsores and an abscess in the groin. With proper nursing he improved, and died some weeks after the subsidence of the fever from an acute pneumonia which came on after exposure to a draught. The fourth died, after a very mild attack of typhoid, from hemorhage and perforation, which came on a few hours after the giving of a large dose of Epsom salts contrary to orders. It is obvious that a certain part of these fatalities might have been avoided if one could have controlled all the factors in the cases.

Three of the cases were complicated by pregnancy, all recovering, while one fatal case developed immediately after a normal delivery. Two of the three, were in the fifth month,and both carried the child through in safety, while the third was confined in the midst of the attack at full term, the temperature before and after labor running from 103 deg. to 104½. Probably little could be done in these cases to prevent abortion excepting to keep the temperature within bounds as far as possible.

There were three cases of lymphangitis of the leg, one fatal, in a man past fifty years of age. The etiology of this complication is not sufficiently clear to enable us to avoid it, excepting in so far as we may support the circulation. The same remark probably applies to a fatal case of suppuration of

the region of the sub-lingual gland, with sloughing of the soft parts about, ending fatally from arterial hemorrhage; and to a case of suppuration of the parotid, in which, however, recovery promptly ensued after incision.

No malarial complications were noted, and it would seem that the time for preventing them would be before the attack began. One case of balanitis could probably have been avoided if it had been noted in time, but it was easily treated when found. I can scarcely see how it would have been possible to have avoided epistaxis in one case, nor hemoptysis in another, although in these particular instances they presented no cause for alarm; nor the indigestion which, in two cases, seriously retarded convalescence.

Although the avoidance of bedsores has been insisted upon for many years, I have seen at times, and especially when the cases have been under the charge of irregular physicians, an utter neglect of the general rule that a patient seriously ill should not be allowed to lie continuously upon his back. The familiar rules as to cleanliness and proper attention to the first signs of inflammation of the skin, together with proper support when needed, to relieve the pressure, will certainly suffice to prevent many bedsores. I have nothing new to suggest in this connection, but wish simply to call attention to so important a matter.

Serious complications involving the lungs were noted in twelve of the cases. The common bronchitis of this disease is not considered as a complication. Of these, three were cases of pneumonia and nine were of the ordinary severe hypostatic pulmonary congestion seen in this disease; two of the latter cases and the three of pneumonia were fatal.

As to the avoidance of these complications, I cannot add anything to the common rules, which direct us to prevent the patient from lying constantly in one position for fear of increasing the congestion, and to keep up the force of the circulation as far as possible by the use of cardiac stimulants if necessary. The use of expectorants is frequently called for. Lung complications are said to be less common under the cold bath treatment than otherwise.

In the 129 cases there were nine in which intestinal hemorrhage occurred, five of these being fatal, although not all directly from the hemorrhage. I think we may do as much in the avoidance of this complication and others dependant upon the condition of the intestines toward lessening the mortality of the disease as in any other direction. The distention of the bowels by gas not only causes such irritation as to cause a considerable rise of temperature in many instances, but no doubt contributes towards stretching the inflamed wall of the bowels, and in that way adds to the danger of hemorrhage and of perforation.

There is a solid foundation for the avoidance of irritant cathartics in this disease after it has passed the initiatory stage, and the case mentioned which died as a result of the administration of Epsom salts, against orders, is one in point. I believe however, that the recent use of castor oil or other mild laxatives which tend to keep the bowels clear of irritant feces when constipation exists, as is so commonly the case here, is a distinct improvement in the treatment of typhoid, and chiefly because it tends to render the complications of which we have spoken less frequent. The effect sought should be the same that we wish in dysentery, a clearing out of matters which tend to excite peristalsis. I believe we may occasionally avoid the enormous distension which occurs at times by following this plan.

The use of boric acid in doses of 10 or 15 grains is stated to assist in accomplishing this same end, but I have not had opportunity to try it.

In hospital cases I have repeatedly seen relapses, and once death follow the ingestion of some forbidden article of food during convalesence. This source of trouble was not met with in these cases to any great extent, and has been so thoroughly insisted on in the past as to need but the barest mention in this connection.

The object of this paper has been to call attention to the fact that one of the best methods of lowering the mortality of typhoid fever is to seek to avoid the complications to which it is so liable; we have considered only a portion of them, but the

others which may occur are of sufficient moment to make it desirable to strive in every way to avoid them if possible.

DISCUSSION.

DR. AXTELL.—As I understand it, the complications of typhoid fever are due to two principal factors; either to pyrexia or to the typhoid germs floating in the blood. Now if by any means we can reduce the pyrexia and at the same time lessen the number of germs floating in the blood, surely we can prevent complications which now develop.

I am glad to know that the doctor mentions cold bathing as giving in his cases, a less number of complications than any other treatment. We know, if we know anything, that cold bathing can reduce temperature, and if we can now prove that a cold bath increases the number of leucocytes in the blood, we can readily understand how the number of typhoid germs in the blood would be lessened, as we know the main function of the leucocyte is phygocytic, or in other words to destroy or digest pathogenic micro-organisms.

Dr. Thayer, in the April number of the *John Hopkins Hospital Bulletin* publishes a paper based on some observations made by Dr. J. S. Billings, Jr., since last November. Dr. Billings found in twenty cases of typhoid fever that after baths of twenty minutes duration given at 70 deg. Fahr., that blood taken from the lobe of the ear, showed that the average number of leucocytes before the bath was 7.724 and after the bath 13.170. If this increase of leucocytes is universal, Winternitz's recent suggestion that a leucocytosis is produced by a cold bath and that from it we get beneficial results, will hold good.

Dr. Billings is now engaged in ascertaining if the increase is universal, or if the cold bath simply causes an accumulation of leucocytes in the smaller peripheral vessels.

A study was also made of the relative proportion of the different varieties of leucocytes to one another, and while there was constantly observed a slight diminution in the multi-nuclear forms and a slight increase in the uninuclear ones, there was no other difference in the proport on of varieties of leucocytes before and after the baths. The observations of the doctor promise to be fertile in useful knowledge.

ON THE CAUSES OF ŒDEMA.

By Henry Sewall, Ph. D., M.D. Denver.

Nothing is more common in science, and particularly in medical science, than to find it necessary to take up old ideas that had long been believed firmly fixed in fact and examine anew into their reasonableness, very often with the result that we find our premises have been untenable and our conclusions wrong. The subject on which I will venture to speak, the cause of œdema, presents such a case. Once regarded as one of the simplest pathological phenomena, now it is admitted to be one of the most complex; one in whose explanation must be involved the interpretation of a large proportion of the vital processes both of health and disease. To avoid obscurity in discussing the less familiar parts of this subject, I must crave your patience while rehearsing some facts long since known to you.

The discovery of the circulation of the blood is rightly accounted the most gigantic stride that has ever been made in the advancement of physiology, and through it of clinical medicine. But the circulation of the blood itself is but the half of a concrete subject and considered alone, is almost without importance. In the higher animals the blood fluid is retained within the closed system of blood vessels. The protoplasmic elements of the living tissues are outside the blood vessels, and it is to nourish them that the blood exists. It has long been known that the tissues are directly fed by a fluid, the lymph, which escapes from the blood through the walls of the vessels and which is chemically nearly allied to the blood plasma. Once outside the blood vessel and bathing the tissue elements, lymph is supposed to enter the protoplasm of the latter under the moving force of osmosis, and by the same law the poisonous products of tissue change pass out of the protoplasm and enter the lymph vessels by which they are brought again into general circulation. It is evident, then, that notwithstanding the meagerness of our knowledge regarding it, the circulation of the lymph has an importance paramount with that of the blood

itself. Most important of all is that wonderful complex *tissue circulation*, as we may call it, of the lymph which is outside both the blood and the lymph vessel, and which is on its way to give up food to the protoplasm or to remove wastes from it.

Recent researches have established the factof chemotaxis; that certain leucocytes and other phygocytic corpuscles are attracted by and accumulate in the neighborhood of definite chemical materials introduced into the body, while other chemical compounds have the reverse effect and repel the reproach of the wandering phagocytes. It is by no means absurd to assume, as a working hypothesis, that contrariwise, the living tissue protoplasm itself exerts an attractive or a repulsive force, a positive or a negative chemotaxis, for certain chemical compounds, by means of which it draws the food and repels the waste matters. Until recent years, the origin of the lymph from the blood, its amount and quality, seemed a simple matter. By the known laws of osmosis some of the blood plasma must escape through the vessel walls by reason of the chemical changes produced in the lymph by the tissue elements, since in general, chemically different fluids diffuse into each other. Moreover, the blood within the capillaries is under a positive pressure which presumably, would be sufficient to cause an excess of transudation in the direction of the lymph spaces and tissues. Then again, the well known fact that in a functionally active organ the arteries are dilated and the pressure within the capillaries is increased, seemed to account in a satisfactory way for the accelerated transudation of lymph under these conditions. Here is a field, however, in which the facts of pathology have corrected the theories of physiology. In healthy life the ratio of the rate of transudation through the walls of the blood vessels to that of the removal of lymph from the tissues, varies only within narrow limits, so that at any time only enough lymph is found within the tissues to fairly moisten them. Let the ratio of transudation to that of lymph removal be decreased, and we would find the tissues dessicated. Let the ratio be increased, and we find œdema; for it can hardly be doubted that in œdema the excess of fluid within the lymph spaces has come from the blood, although chemically the char-

acter of the œdema fluid may differ widely from that of normal lymph.

Looked at from an *a priori* standpoint,at least the following factors may be considered to participate in the production of œdema. 1. The quality of the blood; experiments on osmosis make it certain that every substance in solution has a specific rate of diffusion through membranes, and it is not difficult to imagine that the diffusion co-efficient of the blood varies with the quality of the fluid. 2. The blood pressure; the idea is firmly fixed that the transudation of lymph is in some way proportional to the intra-vascular pressure. 3. The character of the diffusion membrane, *i. e.*. the wall of the blood vessel, which in this case is limited chiefly to the endothelial cells which joined edge to edge, form the walls of the capillaries.

That the character of the blood may have to do with the production of œdema, the clinical phenomena of anæmia and the experimental results from the injection of dilute saline fluids into the circulation, indicate. Certain organic compounds introduced into the blood are said to have a remarkable power in causing œdema. But œdema does not not occur in any of these until the character of the circulating blood is profoundly altered. As will be seen later on, there are reasons for believing that the œdema so produced is a result rather of the effect of the altered blood on the vitality of the lining endothelium than of a change in its osmotic equivalent. The view so long held, that blood pressure alone was the principal factor in the production of œdema has been so clearly disproved by clinical observation and physiological experiment that it can no longer be considered tenable; no known increase of arterial blood pressure can cause œdema in a healthy vascular circuit.

For a number of years the conception has been developing, until now it is formulated as an expression of belief by the foremost students of physiology and pathology, that the will of the blood vessel is not the passive diffusion membrane it was once taken to be, but that it, at least as regards its endothelial lining, is a living organism or group of organisms, of certain definite powers, and extremely sensitive to changes in its environment. This living vascular endothelium is the diffusion membrane

through which the blood plasma must ooze to replace the lymph. These endothelial cells, when healthy, allow the transudation to occur at a certain definite rate, and provide that substances shall pass through them in fixed proportion. Let, however, these endothelial cells be subjected to adverse influences, particularly to poisonous matters circulating in the blood and the normal resistance to the transudation of certain compounds, and their regulation of the percentage composition of the transudate is diminished, and œdema, with more or less abnormal chemistry of the exudate, is the result. Indeed, there are accumulating reasons for believing that, not only is the living capillary wall endowed with selective power over the quantity and qualities of the materials passing through it under the hypothetical action of the law of osmosis, but that this transference of fluid is not a simple process of osmosis and transudation but of true secretion, under the control of secretory nerves. If a glass tube be placed in a duct of the sub-maxillary gland and the chorda tympani nerve be laid bare and cut, no disturbance will follow, but if the peripheral end of the cut nerve that connected with the gland be laid upon the electrodes and irritated, at once the gland reddens, pulsates, and a rapid stream of saliva flows from the tube in the duct, under a pressure, too, which may be greater than that of the blood in the carotid artery. The only obvious explanation of the result is that the nervous impulses travelling down the chorda tympani have, caused the gland cells to actively absorb fluid from the lymph bathing them and to forcibly pass it into the duct of the gland. Heidenhain, perhaps the ablest investigator of this subject, appears to be of the opinion that transudation through the vessel walls is like that through the cells of the sub-maxillary gland, an act of secretion under the control of secretory nerves. If this be true, we must look of course, for vascular secretory nerve centres, and for afferent nerves by whose irritation transudation may be reflexly excited. Whatever be the truth of this particular hypothesis, it is a significant fact, that in dogs venous stagnation produced in the posterior extremities by ligature of the vena cava, causes no œdema except when the vasomotor nerves are divided; when the sciatic nerve, for example,

is cut on one side, there is œdema on that side but not on the other. The general statement seems indisputable that normal transudation can occur only through healthy vascular endothelium, and that the conditions which produce œdema are conditions which lower the vitality of that endothelium. The meaning of the various clinical precursors of dropsy and œdema, such as impoverishment of the blood, as in chlorosis, obstruction to the circulation, as in cirrhosis of the liver, deterioation in the quality of the blood, as is probable in nephritis, local inflammation, septic and non-septic, in each case seems clear, and œdema seems to be the natural pathological result, when we consider these conditions as provoking vital changes in the living cell wall through which the fluid must pass.

Through experiments on living animals at least two ways have been determined in which the vitality of the vascular endothelium may be affected. 1st. Directly under the influence of certain poisons. Thus Wooldridge, as quoted by Horsley, showed that when both femoral veins were tied no œdema resulted, but if into the vessel of one leg a small quantity of what he called "tissue fibrinogens" were injected, abundant œdema occurred in that leg. It is not hard to believe that, in the œdema of local infection the ptomaines resulting from bacterial activity are the potent factors in producing the swelling through their influence on the endothelium. And even in aseptic wounds we have certain cells dying and giving off death products, which perhaps, act as poisons on the still living endothelium. 2nd. Perhaps a more important cause of œdema is the reduction of the vitality of the endothelium by starvation. Any interference with the flow of blood through an arteriole must diminish the amount of nutritive material passing into the capillaries arising from it. When we consider the extreme sensitiveness of protoplasm to even a momentary failure in its supply of oxygen, it is not difficult to conceive a slight stagnation, or even reduction in the volume of the circulating blood current sensibly affecting the permeability of the endothelium. Thus it has been repeatedly found that clamping the renal artery for a few seconds is marked by the appearance of albumin in the urine, and this albuminuria not only accompanies the

urinary flow which occurs on opening the artery, but is coincident with the small amount of secretion produced during arterial closure. On the other hand, no simple increase of blood pressure in the kidney has ever been found to cause albuminuria. It seems to be the present tendency among pathologists to ascribe to vascular anæmia alone, without regard to subsequent increase of blood pressure, the occurrence of this group of œdemas. The writer ventures to express, however, an opinion arrived at more than five years ago, that though the primary condition making œdema possible is to be found in the local anæmia, it is the subsequent increase of intra-vascular pressure due to the full inflow of the blood current, that makes the œdema actual and evident.

Long ago Marey made a physiological observation of great importance in this connection, namely, that on rising in the morning a person's feet are larger in size than later in the day. People to whom the size of the feet is a consideration are well aware that their tightest boots cannot be put on in the morning. The explanation seems plausible that the vascular endothelium of the lower extremities had, during the sleeping hours, been adjusted to withstanding a certain transudation pressure, much less than that experienced in the upright position; when, therefore, the erect position is assumed, it requires time for the vascular protoplasm to adjust itself to the new mechanical conditions and support the column of blood. Again, Senator holds that the occurrence of physiological albuminuria is a fact and points out that traces of albumin in the normal urine may be looked for in the hours of the forenoon only. It is probable that, during the night, the kidneys are comparatively anæmic; the events of awakening, rising and eating breakfast no doubt greatly increase the blood pressure in the kidney, and, according to the idea just expressed, this would explain the passage of albumin through the coils of the glomeruli for such a time as would be necessary to enable the glomerular cells to react to the changed mechanical conditions. At this day any theorizing which cannot be submitted to the test of experiment must be looked on with great distrust; still, from the foregoing considerations there is an evident and at-

tractive explanation of the close relation existing between the fluctuations in external air temperature and the origin of various inflammatory diseases. A sudden contraction of the surface blood vessels would drive the blood into interior organs, previously relatively anæmic. On the same principle which accounts for the swollen feet in the morning, these internal organs would be rendered œdematous and, therefore, less resistant to the onslaught of pathogenic micro-organisms, and we might reasonably expect a pneumonia, a pleurisy or an enteritis. Again, it is an hypothesis that has some support in observation, that a vascular area thus once subjected to the influences which produce œdema, falls progressively more and more easily under control of such forces, and we may find herein the explanation of various chronic effusions. I desire to make the point, which facts appear to support, that œdema, in a limited degree, is a frequent occurrence in normal tissues supplied by normal vascular machinery, and that this œdema is a result of an increase of local blood pressure succeeding a period of comparative anæmia. The whole conception turns on the view that the protoplasm of the vessel wall, either directly or indirectly through the medium of nerve centres, normally adjusts its resistance to transudation to the intra-vascular pressure prevailing; with an increase of pressure there must be a new adjustment to prevent excessive transudation, and this adjustment comes about more slowly the longer the condition of low pressure has persisted and the more profound has been the condition of anæmia.

In laboratory and clinique, this great subject is engaging the thoughts of able workers the world over, and there seems to be in the air a whisper that we shall, ere long, be able to grasp a generalization that will knit together and explain many now obscure facts in medicine.

URIC ACID DIATHESIS.

A CLINICAL STUDY.

BY N. WIEST, M.D., DENVER.

In my last paper I endeavored to call attention to some of the evils arising from excess of uric acid in the system. Mention was made of the fact that to it many nervous troubles, throat affections, headaches, rheumatism, etc., were due; therefore the following cases are cited to verify some of the statements made.

The neuroses, migrane, sick headaches, etc., are so intimately associated that many of the cases illustrate both, and will be mentioned together, with a few purely neurotic cases appended. That a large majority of these troubles are due to excess of acid there can be no doubt in the mind of the physician who has studied the cases. They come and go with such due regularity that even the patient comes to the conclusion that they are due to the accumulation of "something" in the system, the results of which are felt at stated intervals, and relief from which is obtained as soon as the economy can get rid of it. They are designated bilious attacks, sick headaches, or "one of my spells." After they are passed the patient feels like a Colorado atmosphere after one of our glorious sand storms; wonderfully clear and bright.

Case 1.—Mrs. D., age 54; married; mother of five children; native of New York state. Has lived in Denver about nine months. For years has suffered with sick headaches; at first the attacks came on at intervals of six weeks or two months, gradually increasing in frequency until recently they came every other day. Of course the patient was getting exhausted, irritable, and feared she was losing her mind. Life was becoming a burden and even the most trivial things assumed gigantic proportions to her. She came to me in March of the present year, completely discouraged, and very much depressed. She was put upon a good, plain diet. Tea, coffee, pastry and indigestable vegetables were forbidden. She was told to avoid all social demands that tend to worry and

annoy, and was put upon the following: Sodium salicyl. dram 1-ss; ess. pepsin (Fairchild's) vi dram; aquæ qs. ad. viii dram. Sig. Teaspoonful three or four times daily, to be increased or diminished as necessity required. I also gave her some of Schiefflin's pil. phenacetine et caffeine cit. with directions to take one every hour if she felt the headache coming on.

I examined her urine and found it contained large quantities of uric acid. The quantity of urine passed from day to day was normal and remained uniform. After taking the medicine a week she came back and said her headaches still came on every alternate day as usual, but were very much less severe. She continued to improve until, at the present time, she is free from the attacks, with the exception that if she overtaxes herself, either mentally or physically, for a number of days in succession, she feels the tendency toward an attack; but by resting can ward it off.

Case No. 2, presented some novel features. Mrs. B., age 27; married; mother of three children. Came to me recently for treatment for uterine trouble, casually mentioned the fact that she was subject to severe bilious attacks about once a month or six weeks, but always felt better after an attack than before.

Last week I had the privilege of watching the course of one. Headache intense, frontal and occipital, constipation obstinate, urine scanty, highly colored and loaded with uric acid just at the termination of the attack. For a couple of days before the onset the patient complained of a peculiar burning sensation at extremity of cheek bones, elbows, knees, and shoulder blades; these burning areas were very annoying, and she said made her nervous. They disappeared with the attack. Patient has never had rheumatism, but has been troubled at times with severe neuralgic pains in various parts of the body. She does suffer with attacks of indigestion, though not at all times; usually notices it before one of her headaches.

I opened her bowels freely with calomel followed by seidlitz powder and gave her phenacetine and salol. Improvement and recovery rapid.

Case 4. Mrs. S., German by birth; age 40. Has resided in this country twenty-two years, and has suffered with headaches more or less during that time. They began by coming on about once every two weeks, gradually increasing in frequency until they came regularly every other day, commencing in the neck, and extending upward until the whole head was involved. They were very intense in character, leaving the patient exhausted after they passed off. Appetite good, bowels regular, has rheumatic pains, sometimes in one portion of the body, sometimes in another. About two years ago she contracted a severe cold by getting her feet very wet and becoming thoroughly chilled while hanging out clothes after a heavy fall of snow. This brought on a rheumatic attack that produced phlebitis in the lower extremeties, which remained until the present time. Patient had been sent to Germany for a year with no benefit. This, with the wearing of elastic stockings, was the only treatment she had.

I found her urine scanty and full of pus and acid; put her upon salicylates with regulated diet, forbidding coffee, wine and beer, with directions to drink plenty of mineral water. After a week's treatment the pus disappeared, headaches became less intense, until now at the end of three months she can walk about the city with ease, and is very much relieved of her headaches though not entirely cured. The urine at the last examination was almost normal. These cases could be greatly multiplied, but time and space warn me to pass on to another class. In our last paper we said that tonsillitis and kindred forms of sore throats were largely due to this same agent, and consequently might be classified as rheumatic sore throats. In nearly every case that has come under my observation during the past year, I have found the rheumatic diathesis well marked. And I find it yields rapidly to antirheumatic treatment without any attention being paid to local measures, though local means do relieve or palliate the distress and make the patient more comfortable while the constitutional means are curing the disease.

Case V. K.; boy; age 8 years. Has had periodic attacks of tonsillitis with fever ranging from 101 deg. to 104 deg.; tongue

heavily coated, throat intensely inflamed with tonsils enlarged and covered with white exudations; swallowing difficult. I have attended the boy through repeated attacks and have always found them due to indiscretions in eating, drinking so-called light beverages, and over taxing at play. The boy is of a decidedly rheumatic diathesis, having had repeated slight attacks of the disease. His father has had a number of attacks of gout, therefore the boy comes honestly by his inheritance. The case has always yielded quietly to treatment, which consists of a dose of calomel for a starter, followed by hourly doses of powders, each containing Pulv. Resin. Guaiac. gr. 2; antikamnia 1 gr. These powders to be given every two hours as the case improves. In extreme cases I swab the throat every three hours with a preparation of equal parts tincture chloride of iron and glycerine.

Every physician has numberless cases like the above, and will have plenty of chances to investigate and determine if I am not correct in saying they are found in rheumatic patients and yield rapidly to anti-rheumatic treatment. In some of the cases it has taken some time to detect the rheumatism but sooner or later it crops out.

Perhaps the most annoying result of an excess of uric acid is the distressing nervous symptoms accompanying it. Since my last paper I have been noting some of these cases but will impose only one or two upon your attention. If a man is called a crank I immediately wonder if he may not be a victim of uricacidemia. If anything can make a man at outs with himself and everything around him that will do it.

You feel depressed, with a feeling of impending danger hovering over you. A tired-out feeling most of the time, with disinclination to bodily or mental exertion, and how can you expect one to keep cheerful and happy. Add to this that restless, unsettled feeling with aching of the muscles, sometimes amounting to severe cramps. Then do you wonder that some of the less brave attempt to end it all by self-destruction.

Such a case has just come under my notice. Mr. B., male; age about 30; married; pleasant home surroundings, but had been unsuccessful in business and finally became reduced

through losses in business so that his wife found it necessary to take a few boarders to help through the dull times. This, together with the loss of a position he had secured so preyed upon his mind that he attempted to take his life by taking morphine. In studying his case I find uricacidemia highly developed. He informs me that for months he has been very nervous, has suffered intensely with headache, flushes of heat with congestion of eyes and face, has flashes of light in his eyes. When he lies down and closes his eyes he has a sense of falling through space, even before he falls asleep. He complains that when he is engaged in conversation he suddenly looses the thought in mind and cannot regain it, try as he will. His family has noticed this in his conversation and did not know what to attribute it to. The man is hysterical, as is shown by the fact that when he took the morphine (only three grains) he *immediately* fell backward with eyes set, teeth and hands clenched, and body generally in a state of rigor. The day following he was still very hysterical, though heartily ashamed of his attempted self-destruction. I have him under treatment and shall be interested in the outcome.

Just how large a figure uric acid cuts in these diseases, whether it is *all* the cause or only a factor, I am not yet prepared to say. The subject is receiving much attention, and we shall soon know more about it. One thing is certain, and that is, we find a great excess of the acid in all cases like the above mentioned, and as the acid decreases the case improves. In all the cases I have had under observation there has been deranged digestion or dyspepsia to a greater or less degree, and the most important factor in the treatment is to correct such disturbances. This is best done by regulating the diet, the taking of well selected mineral waters, and strict attention to bathing and exercise, keeping all the organs and skin in healthy, active condition. A man with healthy kidneys and a well regulated portal system will not be troubled much with uricacidemia.

Dr. Bigelow in a paper upon this subject says: "The presence of an increased quantity of uric acid in the urine shows that more of this substance or its salts is being excreted than in health. A large proportion of the uric acid resulting from

the disintegration of albuminous substances taken as food or forming constituents of the blood or tissues, combines with ammonia, soda, or lime, forming urates of these bases, which are excreted in the urine. In cases where considerable excess of nitrogenous matters are taken in the food, much of the excess passes away as uric acid. In gout, the presence of uric acid in the blood has been shown to be constant. The kidneys lose, to some extent, their power of excreting uric acid, although they eliminate urea as in health."

Uric acid exists in the blood in combination with an alkaline or earthy urate which is comparatively soluble. The presence of uric acid in the blood and urine is physiological. Excess of uric acid in the blood may be harmless if the elimination is not obstructed by congestion of the kidneys and inactivity of the skin.

A word in regard to the use of the mineral waters. Experience proves they are beneficial. I have treated cases with and without the use of them and have found the cases that use freely of the waters improve most rapidly. I have enjoyed using the Londonderry Lithia water because of its decidedly beneficial results in these cases. The only reason I have not used it even more extensively is because it is difficult to obtain in our far western markets. Some of our Colorado mineral waters are very good. I do not wish to discriminate in favor of any particular one for I have not tried many of them, but have found Manitou soda, Springdale seltzer, and Colorado Carlsbad to do very nicely.

Of the drugs, of course the salicylates still have the preference. Salol and phenacetine are great favorites with myself. At present I am giving citrate of lithia, Wyeth's effervescent lithia tablets, a trial, and must say that so far as I have had time to test it I am disposed very strongly in its favor. The benzoate and salicylate may be preferred in selected cases.

Dr. Bigelow also says: "The urate of lithium is freely soluble; and, therefore, when lithium in combination with the vegetable acids is administered, these salts are decomposed in the system, and the lithium combines with uric acid, renders it

soluble, and thus favors its elimination. These salts are also diuretic, and the administration of lithium produces an increase in the urinary secretion.

REPORT OF FIFTY-EIGHT CASES OF PNEUMONIA IN COLORADO.

By H. B. Whitney, M.D., Denver.

It may prove of interest to briefly analyze a series of 58 cases of croupous pneumonia which have come under my observation in Denver during the past two years. A large proportion were hospital patients, hence the frequent impossibility of making a complete record.

Of these 58 cases 51 were seen during the winter of '91-'92; while during the following winter, although my term of service at the hospital included the first four months of '93, the cases of pneumonia numbered but 7. The remarkable frequency of pneumonia in the winter of '91-'92 so great as to be practically an epidemic, is probably to be accounted for by the prevalence at that time of influenza. That pneumonia is both more frequent and fatal in the train of influenza seems to be generally admitted.

Most of my patients were in the prime of life. In the first decenium there were 2 cases, in the second 3, in the third 22, in the fourth 18, in the fifth 9, in the sixth 3 and in the eighth 1. These figures represent about the usual liability of the different ages beyond puberty to pneumonia. Only four of the 58 cases were females, a fact however of no significance in hospital practice where in general there is a large preponderance of males.

The portion of lungs affected was the left lower lobe in 15 cases, the right lower in 13 cases. The right upper lobe was affected in 5 cases, the left upper and right middle in two

cases each. There were also 7 cases of consolidation of the whole right lung, and 4 of the whole left. The other cases were varied combinations of different lobes. In 19 cases consolidation of only a part of one or more lobes was detected; in the remainder the lobe or lobes affected were wholly consolidated.

Three important symptoms of pneumonia were present in the following frequency: Deducting those delirious, etc., where no accurate history was obtained, a rusty sputum was present in 37 out of 43 cases or 86 per cent. Initial rigor in 29 out of 39, or about 74 per cent. Early pain in the chest in 40 of 44 cases noted, or 90 per cent occurring 32 times over the lungs affected, and 6 times on the opposite side.

For various reasons the exact day on which the temperature fell to normal could only be determined in 33 cases; 5 by lysis and 28 by crisis. Of the latter, 2 were a-febrile on the fourth day, 5 on the fifth, 6 on the sixth, 6 on the seventh, 3 on the eighth and 3 on the ninth. In nearly every case there was no immediate change in the lung consequent upon the fall of temperature. In no case was the lung found wholly clear previous to the eighth day, and in only 11 cases was resolution noted as having begun between the fifth and eighth day. None began before the fifth.

These facts are interesting in connection with the almost invariable cessation of dyspenœa which accompanies the fall of temperature.

One or two peculiarities in the course of the disease are interesting. In one case the respiration was 35 on the eighth day after defervescence, though the lung was already about normal. In 3 cases delirium continued for several days after complete defervescence. Two or three recovered, one after 5½ days of steady deilrium and subnormal temperature. The third died on the second day after the temperature fell to normal.

Of my 58 cases, 9 are noted as being habitual drinkers and 15 as being temperate or total abstainers. The others are doubtful. Six are noted as hard drinkers and of these 4 died. Of these noted as temperate but one died. The high mortality

of pneumonia among hard drinkers has long been fully established. Fismer gives for Bale a mortality of 55 per cent among the intemperate.

Complications, aside from grippe were as follows: Pleurisy, as indicated by friction was found in seven cases. Empyema developed in two cases, followed in each by operation and speedy recovery. The prognosis of empyema following pneumonia appears to be in general more favorable than in those of other origin. Three cases were complicated by pericarditis. In one there was only friction, result unknown. In a second friction was followed by a slight effusion, perceptible only on percussion over the lower portion of the sternum; this effusion rapidly disappeared and recovery was controlled on the fourteenth day of the pneumonia. The third case was not detected until the *post mortem* examination disclosed a purulent effusion in the pericardium. This was one of the rapidly fatal cases of influenza.

Slight jaundice developed in two cases. In neither did it appear to influence the course of the pneumonia, nor was there any indication of its origin. I could see no good reason for calling these cases "bilious pneumonia," a term which seems to me objectionable and unscientific, implying as it does a distinct form of the disease. Light jaundice is thought by Yurgensen to be due simply to an unusual degree of hepatic congestion, and it generally disappears with the cessation of pulmonary obstruction.

One case was followed by abscess of the lung, characterized by an abundant expectoration of fœtid pus. At first there was simply flatness and bronchial respiration in the right subclavicular region, later the signs of a cavity. A careful search for tubercle bacilli proved negative. After remaining for several weeks this patient left the hospital in very good general condition.

One case was complicated by a general bronchitis and also by that form of insanity known as "Christian Science." He obstinately refused all medicinal treatment, and died.

The mortality of these fifty-eight cases presents some curious and instructive features. Deducting six, in which the

result is unknown, there remain 52 cases, with a mortality of 14, or 26.9 per cent. But it would be far from the truth to accept this as even approximately the usual mortality of pneumonia in Denver. In the spring of '92 the second wave of the recent epidemic of grippe passed over Colorado. During the first twenty-five days of March, 21 cases of pneumonia were admitted to my service at the county hospital, and of these 12 died. The virulence of the disease appeared to steadily increase from early in the month, until during the ten days beginning with March 16, cases 33, 35, 36, 37, 38, 39, 41, 44, 45, and 46, that is to say ten out of the fourteen admitted died, representing the enormous mortality of 71 per cent.

These ten cases demand a brief analysis. The youngest was 19, the oldest 39; all, therefore, were in the prime of life. Only three are noted as drinkers; hence the mortality was not due to alcoholism. Only one of the ten cases was complicated. In only two was there extensive consolidation. On the other hand the symptoms noted all point to rapidly fatal cardiac insufficiency. Cyanosis without special dyspnoea is noted in six cases. In two the pulse is noted as having very suddenly become weak; and in three death was extremely sudden and unexpected. Three are noted as markedly asthenic in character. All these symptoms point indubitably to an insufficient heart, and strongly suggest a rapidly developing fatty degeneration of its muscular element. The latter supposition appears all the more probable because of the total lack of response to the most powerful cardiac stimulants. These patients reminded one of some of the maglignant forms of diphtheritic paralysis, and I am able to account for them only on the hypothesis that influenza was an important factor in the process. I can give no proofs, because in most of the cases the earlier symptoms escaped observation. But there seem to be only two alternatives in explanation, namely, influenza or coincidence. The latter supposition is almost unthinkable, while the former is in accord with the well-known effect of influenza upon the heart.

It seems to me, therefore, that without any unjustifiable manipulation of cases and simply with a view to determining

the probable mortality of uncomplicated pneumonia in Colorado, we may probably leave out of consideration these twenty-five cases which came under treatment during the month of March. This would leave thirty-three cases for the remainder of the two years of which two died, a mortality of about six per cent. Of course, results in such a small series are to be received with great caution. But it is my personal conviction that the mortality of pneumonia in Denver is not higher than at most ten per cent. At Salida, also, some 2,000 feet higher than Denver, the mortality is by no means as high as might be presumed at such an elevation. During a practice of a year and a half in that town I attended about sixteen cases of pneumonia, of which four died. Two of the fatal cases were double pneumonias, and a third was in an infant of five months. I did not get the impression that there was any greater tendency to cardiac insufficiency than at sea level, and I certainly do not think that such a tendency is particularly operative in Denver.

At still greater altitudes than 7,000 feet pneumonia is commonly said to be a very fatal disease; and statistical reports from Leadville, for example, would be very interesting. We know that in pneumonia the heart suffers the brunt of the attack. It is threatened at once from two different quarters; from the fever with its increased demands and degenerative processes on the one hand, and on the other from the inflammatory exudation in the lungs which dams up the lesser circulation. A healthy heart is nearly always able at sea level to withstand these adverse influences and recovery is the rule. But as a greater elevation is reached, the heart is subjected to a third constantly increasing burden. Though all the factors which enter into the problem of the effect of high altitudes upon the heart have not yet been clearly defined, we may probably affirm, 1st, that tissue meta-morphosis is increased in proportion to the degree of rarifaction of the air. For greater evaporation from the surface of the body requires increased heat, and an increase of heat means more combustion; hence increased labor for the heart in the transportation of fuel. The usual lower temperature of higher altitudes also increases the production of body heat and thus works in the same

direction. 2nd. The thinner the air the less oxygen it contains and the greater therefore the amount of blood which in a given time must be drawn through the lungs. Here again is an added burden for the heart, particularly for the right ventricle. 3d. In a rarified atmosphere there would seem to be a tendency to dilatation of all the peripheral vessels of the skin and of those mucous membranes exposed to atmospheric pressure, that within the capillaries remaining the same. Indeed we are familiar with the frequency of epistaxis in high altitudes. That the same tendency to dilatation exists in the pulmonary capillaries, I see no reason to doubt, and if so it must be counter balanced either by the vaso-motors or by an increased force of the heart's action. That a certain degree of elevation is favorable to pulmonary hemorrhage, contrary to what might be anticipated on the above hypothesis, is to be explained on other grounds. Haemoptysis in phthisical cases is usually the result of some impediment to the return of blood to the left heart, and this impediment is frequently caused by the pressure of a narrow thorax. In a rarified atmosphere the expansion of the lungs is increased, the pressure upon the pulmonary veins is removed and notwitstanding any increased capillary distension or intensified action of the heart, the pulmonary circulation is relieved and therefore the hemorrhagic tendency diminished. Unquestionably it is also true that in a healthy individual altitude, by the suction power of thoracic expansion, also favors the right ventricle in a certain degree by favoring the return of blood to the left; and this factor is to be set over against the three adverse influences above mentioned. It is extremely difficult to determine the relative importance of these phenomena, but it would seem as if the balance must be largely against the heart.

In brief it would appear that the following inferences may be drawn from the foregoing considerations: 1st. That influenza has a most fatal influence upon the course of pneumonia. 2nd. That in otherwise healthy individuals pneumonia at the altitude of Denver is no more fatal than at sea level. 3rd. That while high altitudes probably increase the every day labor of the heart and therefore diminish in a certain degree its capacity

to sustain an added burden such as pneumonia brings, still the altitude at which these factors become of importance for the course of pneumonia is certainly not below 6,000 feet and probably above 7,000.

The treatment of my cases was mainly stimulant and generally included alcoholics, camphor, and often digitalis.

OBJECTIVE DIAGNOSIS IN CHILDREN.

By Hubert Work, M.D., Pueblo.

The essentials of diagnosis in diseases of adults comprehends inspection, history, subjective symptoms and physical signs, all of which are to a degree fallible in those of matured structures, but infinitely more likely to mislead when applied to the young in whom many organs are disproportionate in size and incompletely developed functionally.

The yielding, semi-ossified, bony structures through which intra-thoracic diseases must be examined, together with the ceaseless activity of young children and the limited areas accessible to the examiner are familiar impediments to accuracy.

Teachers of physical diagnosis instruct from the adult subject, a further embarrassment to diagnosis in children, and when we remember the absence of personal history and the vagueness of that given by the untrained attendant, the importance of visual inspection becomes apparent.

The infant statesman, comedian and idiot are alike without facial expression in health, but contraction of the muscles from pain and the loss of adipose tissue from wasting diseases gives expression to the youngest face, the latter simulating that of senility. A glance will determine the color of the face and lips, the state of the eyes or detect, if present, the dark rings under them. But aside from indicating physical distress or malnutrition the ingenious speculations of Jadelot by which

he proposed the diagnosis of various diseases by facial lines and angles, much as a geometric theorem is demonstrated, has proven to be of little definite value in paediatrics. Squinting is an important and grave sign in acute diseases, because symptomatic of paralysis or reflex evidence of cerebral disturbance, possibly from accumulation of fluid in the ventricles or of convulsions. If due to the latter cause it may continue long after the waning of the eclampsia. The corresponding widely dilated pupils not sensible to light, are seen in compression of the brain from whatever cause, accumulation of fluid in the ventricles or subarachnoid spaces are the most common. The same condition to a lesser degree is seen in the cerebral congestions of low fevers and in chlorosis diseases relatively uncommon in young children. The contracted pupils will at once suggest opium poisoning or acute cerebral congestions, but they are also seen in normal sleep. If due to the congestive state of brain inflammation, there will be intolerance of light not true of course if due to narcotism or coma. Inequality of the pupils is said to result from affections of the sympathetic system which is the probable explanation for Jadelot's statement that "Irregularity of the form of the pupils occurs from the intestinal irritation of worms."

The position of the body assumed by the infant is less significant than that of the adult, because less able to associate cause and effect, trace pain to its source, or from weakness it may not be able to assume the posture of least distress; yet it is often very suggestive of the diseased condition.

The healthy and tired child will fall asleep in any position, and the new born assumes the posture occupied before birth; but the child that persists in lying on one side or the back with rapid play of the nostrils presents two of the cardinal symptoms of pneumonia; as does lying on the side with legs flexed and arms hugging the chest, suggest the latter stages of tubercular meningitis or kindred cerebral disease. Equally suggestive of forming membranes in the throat is the sitting posture in those old enough, with tearing at the neck, thrusting the hands into the mouth and urgent dyspnoea. The child with

legs drawn up, otherwise resembling the typhoid wasted adult, is in all probability suffering from abdominal disease.

The waking motionless child is not in health. All degrees of activity from the grimaces and aimless gesticulations of the newly born to the boisterous play of the lad are signs of health; their absence betokens mental hebetude, a symptom of the gravest cerebral diseases.

But it must be remembered that dullness of the gravest seeming nature, even to coma, may disappear in a day or two, proving that it was the reflex manifestation of some digestive disturbance or vaso-motor irregularity, perhaps of a comparatimely trivial nature.

A premonitory symptom of the exanthemas is stupor. Of so many diseases is it a prodrome or a developed symptom that all the aids to diagnosis in the hands of the most experienced observer may not enable him to determine to what extent it is a reflex symptom or a secondary condition, whether independent or coincident. It can be distinguished from natural sleep, its next of kin, by the greater difficulty in arousing the patient, the dull apathetic countenance together with querulousness if the strong desire to again lapse into slumber be combated. Sleeping or wakeful quiet, succeeding the restlessness of a feverish child without decline of the high temperature, indicates cerebral complications or increasing weakness, in either case an unfavorable symptom and easy of observation.

In cerebral exudations it is noticeable that the head is constantly rubbed on the pillow together with pulling of the hair and ears and aimless beating about the head with the hands. Tapping the vertex with the knuckles is a common symptom of uremia, often a companion of its convulsions.

The flexed thumb with the hand closed over it is a time-honored precusor of convulsions but it is also seen in atrophic children to whom eclampsia may not be imminent. It has been said that these are also signs of cerebral atrophy subsequent to general atrophy; a statement I have not been able to verify in practice.

It has been tacitly agreed that children cannot locate pain. Wholly true of the very young, but their ability to do so after

the second semester of infancy is, I believe, not generally appreciated. A child incapable of words will rub the teething gums or point to the ear in otitis and to the anus if seat worms be present. The boring into the nose in the latter trouble would seem less causeless if the facility with which these parasites may be carried from the one location to the other were better remembered.

Pulling at the genitals would seem to argue against this theory since it is frequently caused by the nervous unrest incident to teething, and to a lesser degree by cerebral irritations. But the possibility of reflex sensations from these causes is not more improbable than the dilating of the pupils which can be produced by tickling the soles of the feet. Inflammatory conditions of these parts are more often due to self-inflicted injury suggested by reflex stimuli from the irritation of some more or less distant organ and to harsh attempts at cleanliness than to the pathologic action of the natural secretions.

Reference to teething as a feature in diagnosis is perhaps pardonable since there are yet in practice physicians who encourage the belief that this purely physiological process occurring to the young of the other mammalia without being a source of local irritation even and to a large per cent of children without any disturbance, is capable of causing in other children diseases of fatal gravity. Independent however of individual belief, the fact remains that very meager success awaits the prediatricor who is not willing to expunge from his mental list of morbid etiologies, that of dentition.

Mouth breathing should direct attention to the posterior nares and suggest the presence of adenoid growths at that point, and should prevent us diagnosing as trivial, conditions which if not relieved are capable of producing permanent physical deformity of the chest.

The direct result of obstruction to the entrance of air into the lungs, is of course their deficient development; a consequence of which is the contracted thorax. But a more remote result due to the faulty oxygenation of the blood from this cause is the mental hebetude and retarded brain development. Less easy to explain is the aleviation of nocturnal enuresis by

the removal of post nasal obstructions. None the less a truth because an empirical one.

The unilateral purulent nasal discharge should at first glance suggest the presence of a foreign body.

If the physician is fortunate enough to witness the vomiting of a child, its peculiarities will be full of meaning to him, but if compelled to depend upon description he will rarely learn more than the knowledge of its occurrence. From the spontaneous and provisional regurgitation of the surfeited nursling, to the continuous and apparently causeless emesis of meningitis, it is a symptom of functional, organic and reflex diseases of every degree of gravity. If occurring only after the child has nursed and been laid upon the left side, it is probably due to the pressure of the liver on the distended stomach. Infants sometimes refuse to suckle for the same reason. That occurring suddenly and repeatedly without nausea, expelled with force and induced by suddenly raising the patient to the sitting posture is a messenger of meningitis. It does not yield to treatment because the result of irritation of the pneumogastric nerve center, and from this fact is derived the rule that little, often no, vomiting occurs if the meningeal inflammation be localized in the convexity, and also explains the equality of the pupils in many cases. Vomiting is a frequent and early prodrome of the acute fevers including pneumonia, and very commonly is the first symptom of peritonitis. If uninfluenced by the administration of opium the fluid ejected will be spinach-green in color, at one time thought to be diagnostic.

The scores of diseases in which vomiting occurs either as a prodrome or as a symptom of the developed disease precludes their enumeration even and certainly any attempted description of the vomica. But if it be remembered that the four primary causes of vomiting are: Irritation of the preripheral extremities of the nerves supplying the parts immediately accessory to the act itself; the terminal reference by these nerves, of centric irritation; to mechanical obstruction of the stomach or intestines, and to sympathy, the foundation for diagnostic appreciation of this symptom is well laid. The time of its oc-

currence with the relation to the taking of food and the influence of position in provoking it, are each of importance.

The nice distinctions possible to the observant and the experienced eye, each must learn for himself, and because we can neither have them didactically taught nor read them, too many of us ignore them. And since instruments of precision have come to be so implicitly relied upon, and each organ of the body now has its specialist, the ability to observe, weigh and group symptoms, from necessity the sole reliance of our medical forefathers, has become a lost art to many of us young in medicine.

ASEPTIC QUALATIES OF THE COLORADO ATMOSPHERE.

By Dr. W. F. McClelland, Denver.

Just at 4 o'clock, I happened to be looking over the series of reports and I saw "Dr. W. F. McClelland, On the Aseptic Qualities of the Colorado Atmosphere." I just studied the matter for a little while, and I concluded I was not very easily backed down, and I concluded in order to defend myself I would have to go into a little bit of ancient history. In doing so I refer to a letter written to Dr. John T. Hodges, at St. Louis, in reference to the effects of the climate in this region upon meats, vegetables, etc., and also upon the subject of putrefaction." The letter in question is as follows:

Denver, Colo., 1876.

Dr. John T. Hodges, St. Louis.

Dear Sir: Dr. Lemen, of this city, called at my office and read a letter written by you. He requested me to give you my experience of the climatic influence of this section on fresh meats and vegetables, and the absence of putrefaction.

The question is frequently asked by eastern physicians and others whether it is true or false that fresh meats will keep untainted, hung up in an out house, or on the outside walls of a

miner's or lumberman's camp, simply preserved by the purity and dryness of Colorado air. The truth of the statement I am ready to vouch for, and will give a few instances of the many which have fallen under my own observation. I have just closed my fourteenth year in Denver, Colorado, and in my professional visits over the country to administer to sick ranchmen I have taken my meals at all these places, and have seen the cook take her butcher knife and plate, go to the outhouse, or outer wall of the camp, in or on which would be hanging a quarter of beef, or the saddle of a black-tailed deer or antelope, which had been hanging there for general use for a week or ten days, and cut a plate of steak which looked as new and fresh as new cut chops from a first-class meat market, (excepting the edges being dessicated), and when cooked ready for the table, I found it fresh, sweet and tender. In fact, putrefaction to any great extent is out of the question. The dryness of the atmosphere causes the outside to dry so perfectly that no vermin or fly can penetrate the substance, and if not interfered with the whole mass will dessicate to the bone. To this fact all our old-time butchers will certify. It has only been a few years that ice has come into use by the butcher, the cause being the compactness of houses, sprinkling the streets, growth of towns, and general irrigation. This dessicating process extends to carcasses of all animals, as well as to fowls and birds, the carcass of the largest animals, the horse and ox, undergoes but little putrefaction; and if death occurs in the hottest days of summer, gas will form in the bowels, and in a short time will burst and escape, collapse at once takes place, and the drying up of the carcass begins.

The skin and muscles will dry down to the bone, and the carcass remains whole for an indefinite time, sometimes for years. I have seen the body of a dead horse keep its shape, with hide on most of its body, for over two years, and which I used as a landmark in my professional visits in the night up and down Bear Creek. Later on the hide gave way so as to expose the contents of the bowels, and there lay the contents of the stomach the hay that the old horse had eaten at his last meal lay in this wigwam perfectly dry and preserved. The fact is that when an animal dies scavengers have to hurry even to get

a taste, and that taste is usually confined to the eyes, and externals of the carcass.

To prove this drying process you have but to go with me through the streets, alleys, and vacant lots of our city and take a look at the dead dogs, cats, rats, and chickens which dry up with the hair and feathers on, and rattle if you stir them.

The putrefaction so common in humid climes with all its attendants, viz., center of attraction for the buzzard, wolf, green fly and maggot, are unknown in this country. The only fruitful field for the deposits of the green fly and the sports of the maggot, is the slop barrel which contains the debris or offals of the kitchen kept well moistened and infrequently moved. The question underscored, that is, "Whether fresh meats and vegetables kept moist will undergo putrefaction," I answer yes, but not so rapidly as in the states. This is a very dry climate, dews and mold are very uncommon. I may remark in conclusion that the fresh meat must hang free, so as to allow a free circulation of the air.

DISCUSSION.

Dr. Collins: I would like to say in regard to this, that I have witnessed the same as regards carcasses of wild game hung up on trees. I remember to have passed through the mountains south of Canon City, fifteen years ago, coming December. The fall had been quite warm, the sun was shining brightly and had been for a week, and I passed a cottage where there were forty-two carcasses of black-tailed deer, that had been hung there from August. They were in a perfect state of preservation.

While that was true thirteen or fourteen years ago, it is not true today. The causes, I think, have been alluded to in the letter just read. We have more moisture, we have more shade, we have a greater number of buildings, not only in the city but upon the ranches and in the country generally. Anyhow, you will find the same results upon the plains where you do not come in contact with human habitation. Why that change is so, I can only surmise, but I suppose it to be a result of the more general irrigation, the use of more water and the moisture consequent upon the use of that water retained in the ground.

I think no surgeon now, while they might have done so fifteen or sixteen years ago, would trust to the aseptic qualities of the atmosphere of Colorado to get the best healing process in a surgical wound. We have now to resort to as strict an aseptic or antiseptic treatment as we did in the older countries.

DR. MCCLELLAND.—Of course this does not apply to surgery. I can say this, however, that during that period I had two cases of compound gunshot wounds, one in the middle third of the thigh. I also had a pistol wound in the groin, passing in under Poupart's ligament, and passing under the abductor muscles of the thigh. The latter of these healed by first intention. A few years afterward, Dr. Poste, surgeon of New York, was here, and I related the case to him. He said: "I have come to the conclusion that gunshot wounds usually suppurate." I said: "So have I, but here is an exception." Just what effect the atmosphere may have had in this instance, I cannot say. It may have been more in the man than the atmosphere or anything else. He was a notorious character (Slade, his name was) and his history is famous.

In the other gunshot wound, I had good union. I thought the atmosphere and the climate here added very much, especially in keeping up the condition of the patient. I also knew of another gunshot wound where the bullet passed in under the umbilicus, passing through the lumbar muscles. Nothing in particular was done to this wound, and in five or six weeks the man was going about his business with no trouble whatever. In the healing of lacerated wounds I have thought the climate was the particular factor.

I also had a case of compound fracture of the tibia and fibula at the middle third. I made use of Scultet's bandage and posterior splints for four days, and I had healing with but very little pus. In fact, I only occasionally cut a little opening in the bandage for the escape of serum or pus. He got well without any difficulty whatever, and he could hardly tell where the wound was.

A MEDICAL LIBRARY FOR COLORADO.

By John C. Dana, Librarian of the Denver Public Library.

A special provision in the state school law permits any school district to levy a tax of one tenth of one mill, the proceeds of which are to be expended exclusively for the purchase of books for a public library. Under this statute the Board of Education of District No. 1, which embraces all of Denver south of the Platte and east of Cherry creek, levied this tax in 1889, and established a library in the west wing of the High School building. They opened the library in June, 1889, with a few books which were handed down from the old public school library. This tax produces about $5,000 per annum. About $15,000 have been expended in the past three years in the purchase of books and periodicals, and the library has grown from 1,500 to 18,000 volumes.

About two years ago, it was suggested by some of the medical men of Denver that the Library begin the purchase of medical books. They represented to the library committee of the Board of Education that there was no medical library in the state worthy of note that was available for general use.

They suggested that the Library spend each year such sums as the committee might think it advisable to devote to such a purpose, that the fact that a few good medical books were to be found at the library be brought to the attention of Denver's medical fraternity, and that contributions of books and journals, old and new, be asked from all interested. As a result of the carrying out of this plan the Library now has a medical library alone containing 700 or 800 bound volumes, several thousand numbers of unbound journals, and the current issues of fifteen or twenty of the best medical periodicals of this country and Europe. A few months ago it was decided to form a Medical Library Association, to further the work of building up a public library. Forty or fifty names were rapidly received and the association was formerly organized and incorporated with Dr.

J. T. Eskridge as President, and Dr. Henry Sewall as Secretary-Treasurer. Each member is asked to pay $5.00 as annual dues. This money is spent for medical books by the associations executive committee, in accordance with the suggestions and reccommendations made by the several members. The books and journals so purchased are to be placed on the shelves of the Public Library, open to any one's use in the library, but lent only to members of the association. They remain the property of .he association, are marked accordingly and can be removed at any time. The Library will continue to purchase medical books from its own funds, and will each year expend for this purpose a sum equal to the sum subscribed by the association.

You should understand, what all of you who have assisted the public library already know, that the shelves there are open at all times to the public. You are not obliged to approach the books through the aggravating medium of an attendant or a catalogue, but can always examine them yourselves at first hand. The library is open every day, Sundays included, from 9 A. M. to 9. P.M.

Within a short time, the library of the medical department of the University of Denver, has been placed in the public library, under the same restrictions and in the same way as is proposed to place the books of the Colorado Medical Library Association. They are marked as the property of the University of Denver, and at any time can be taken away. A number of doctors in the city have contributed books and journals from time to time, and if any of you see fit to place books there as the property of the public library, or to remain your own property, the matter can be easily arranged, and if any of them should become mutilated, lost or destroyed, their value will be refunded.

There is still another advantage in placing this medical library on the shelves of the Library. If the physicians of this city should attempt to establish a medical library, and should spend even three thousand dollars a year on it, they would find the cost of administration to be considerable. There is cost of housing, lighting, cataloguing, indexing, lending, seeing that

books are duly returned, and numerous other expenses, By the arrangement which the medical association has seen fit to make all this expense is saved. The Public Library in view of all the advantages it derives from having the books of the Medical Library Association on its shelves, incurs all the incidental expenses, and guarantees the safety of the books.

I would further call your attention to the fact that the Public Library is an institution that is permanent. The Board of Education of District No. 1, has the management of it. It is qualified to receive gifts or bequests of any amount. Any confidence you may repose in it, you may be sure will not be misplaced.

In order further to interest you in this matter the Colorado Library Association has furnished a little entertainment at the public library at the close of this meeting. There are certain light refreshments. It will greatly please the library management as well as the association to have you all come and see us this evening if only for a few moments.

A CASE OF DISLOCATION OF THE FOURTH CERVICAL VERTEBRA WITHOUT FRACTURE.

By A. M. Holmes, M. D. Denver.

In clinical study, the success of a diagnostician depends to great degree, upon the faculty of close observation of the minutiæ, and the ability to correctly interpret their meaning.

In no department of medicine or surgery do we find a greater need for the exercise of this faculty, than in that important class of cases, where the functional activity of the cerebro-spinal centers has been impaired or destroyed, either through the various agencies classified as diseases, or through the more violent and sudden means inducing acute traumatism.

In a very large percentage of clinical cases reported, the accounts are so defective, lacking in precision and exact-

ness of description, that the true nature of their lesion remains in doubt. On the other hand, there are those who will not accept any case as authentic, unless it is verified by a *post-mortem* examination.

The following case is presented for the consideration of this society, from the fact of its comparative rare occurrence, and on account of the distinct and characteristic symptoms accompanying it, so typical of this form of spinal injury. If such cases are properly studied, and the symptomatology correctly interpreted, they may be the means of throwing light upon some of the unsolved problems of neurology.

History.—On February 2nd, this year, at 6:30 P. M., the accident occurred, which furnished the material for this paper.

The subject, H. P., male, aged 49, weight 160, possessed excellent physique. Previous health and family history good. Being an engineer, it was his routine duty at the close of each day's work, to climb to the top of a water tank to shut off the water supply for the night. For this purpose a ladder was placed loosely against the tank. This evening there was snow and ice on the ground, which caused the ladder to slip. He fell backwards a distance of sixteen feet, the back of the head and shoulders striking the ground.

The fall produced instantaneous paralysis. He was unable to move a muscle below the neck. He retained perfect consciousness, and was able to speak. The only pain of which he complained, was in the lower cervical region, which was localized, and was increased by movement or manipulation. He was carried to his home, only a short distance away, and placed upon a cot, in which position he remained until I saw him two hours afterward.

Symptoms.—I found the patient lying on his back, with the head and shoulders slightly elevated, and the face turned a little to the left. Said that he had no pain except in the back of the neck. Consciousness was not impaired. He had good control of the vocal organs, could speak distinctly, but in a weak voice, with a slow measured accent. To all appearances, he seemed to be in the condition of extreme shock. Face

flushed, anxious expression of countenance, surface cold, pulse at the wrist not perceptible.

On placing my ear over the heart, it was found to be regular but very weak, and only 36 per minute. Temperature under the tongue 92½ deg. Fahr. Thinking there might have been a mistake I took it the second time, taking every precaution to prevent error, and found it registering the same. Respiration exclusively diaphragmatic. It was very shallow but regular, and only 10 per minute. The thoracic muscles were paralyzed. The upper part of the thorax remained perfectly stationary, while the diaphragm performed its function normally.

There was total loss of sensation in all parts below the neck and shoulders. Not the slightest power of voluntary motion in either arm, the body or lower extremities. The muscles supplied by the brachial plexus were all implicated. The line of anæsthesia extended around the body about two inches above the nipples. No line of hyperæsthesia, but rather a gradual diminution from normal sensation to total anæsthesia, covering a space of one or two inches, which might be termed "uncertain sensation." Partial sensation on the outer surface of each arm, reaching a lower point in the left than in the right.

Soon after the accident, the patient experienced a sensation of tingling in the fingers of the left hand. The deep and superficial reflexes were entirely lost. Well marked priapism and retention of urine and feces. Sight and hearing were not affected.

With this formidable array of symptons, it was very evident that we had to deal with a case of extreme pressure, or contusion of the spinal chord. It was also very evident that the lesion was below the origin of the phrenic nerve, since the functional activity of the diaphragm was not destroyed. It was also plain that the lesion was above the origin of the brachial plexus, since there was a total paralysis of both near extremities, and almost complete anæsthesia.

I therefore proceeded to examine the spine, but previous to the examination I gave hypodermically:

Morphiæ Sulph.	gr. 1-8
Atropiæ Sulph.	gr. 1-200.
Trinitrin	gr. 1-50.

to relieve the pain and increase the force of the heart. We then turned the patient on the right side, this being preferable to the left, on account of the weak condition of the heart.

Beginning at the occiput, I passed my finger slowly down the spine, pressing firmly against the vertebræ. When the space between the fourth and fifth cervical vertebrae was reached, there was a distinct and abrupt depression, more marked on the left side. Pressing the finger on this point was extremely painful.

The spinous process of the next vertebrae below was quite prominent. Passing the finger further down the spine, it was impossible to detect any other abnormal deviation or painful point.

I examined carefully for crepitus, but was unable to detect any, which in itself was not sufficient to exclude fracture. Some swelling of the muscles of the neck, but no indication of external contusion. He was very muscular, and I found it quite difficult to distinguish the spinous processes, especially in the cervical region. On the left occipital region there was a contusion of the scalp one inch in length, caused by the fall.

Diagnosis.—By a careful consideration of the foregoing history and symptoms, I gave a diagnosis tof dislocation of the fourth cervical vertebra with or without fracture, causing extreme pressure and perhaps contusion of the cord.

In such cases the propriety of attempting reduction is not questioned by modern surgical opinion. Therefore, having the consent of both the patient and his family, I decided to attempt reduction at once, in order to relieve the compression, as affording the only hope of restoring the function of the cord, and prolonging life. Considering the very low state of the vital powers, the administration of an anæsthetic was believed to be contraindicated.

Reduction.—Having placed the patient on his back, with the aid of four assistants I proceeded to exercise extension. Having placed an assistant at each lower limb, and one at each shoulder, I took my position at the head, with one hand on each side of the head, the fore-finger of each hand resting below

the inferior maxilla, and the other fingers supporting the neck and occiput.

We then began gentle traction, which was slowly increased. When the extension and counter-extension reached the point that his body retained the horizontal position without touching the bed, a sudden jar was distinctly felt by each of us, and was plainly heard by all who were in the room. We then gently lessened our traction and slowly lowered the body to the bed. Neither rotation nor flexion were practiced, fearing that they might be the means of increasing the pressure on the cord. He complained of no pain during the reduction, and to all appearances suffered no depressing effects from the operation, being conscious during the entire time. Still being in the condition of shock, I ordered him to be surrounded with bottles of hot water, and brisk friction made over body and extremities, placing a strong sinapism over the heart, and a cantharides plaster over the seat of the injury.

After awaiting one hour, the pulse was quite perceptible at the wrist, but had diminished in frequency from 36 to 26. Six hours after the accident, reaction was fairly established; the pulse at the wrist stronger, the cutaneous surface warmer, the voice fuller and more audible, the respiratory act increased in volume and frequency, and he began to experience a feeling of ease. In simple compression of the cord the symptoms usually disappear promptly after the dislocation is reduced. But upon making another careful test for the return of the functions of the cord, we found absolute loss of sensation, voluntary motion and the reflexes. Therefore we gave a grave prognosis and insisted on having counsel the next day. Accordingly on the following day, eighteen hours after the accident, Dr. H. T. Pershing kindly saw the case with me, and still later Dr. P. D. Rothwell. The patient was much the same as when I left him the night before, except that he was depressed with the awful consciousness of the approaching crisis. Pulse had increased to 72, and respiration to 26. He had passed a fairly comfortable night, slept several times with intervals of restfulness, and occasionally an attack of emesis. Retention of urine and a well marked priapism. We passed a silver catheter full length, and

failed to draw urine. The irritation of the catheter increased the priapism to such a degree that it deceived us into the belief that there was suppression of urine, and therefore we did not persist with other attempts.

Later in the day, however, twenty hours after the accident, Dr. Rothwell saw the patient and found him very uneasy. He passed a long flexible catheter and succeeded in drawing off over a pint of urine. Dr. Pershing carefully traced the line of anæsthesia, and found it somewhat higher than on the night before. He also tested thoroughly for the deep and superficial reflexes, and has kindly furnished me with the following notes: "The line of anæsthesia ran in front between the first and second ribs, behind along the spines of the scapulæ. On the right side it ran over the acromion, on the left it extended downward about two inches from the acromion, leaving a triangular space of normal sensibility over the deltoid muscle. Total loss of both deep and superficial reflexes."

There was occasional emesis during the first twenty-four hours, and it was of a very peculiar variety. The abdominal and thoracic muscles took no part in the act. It was produced by an involuntary contraction of the diaphragm and the muscles of the stomach itself, to all appearances, without any effort or exertion on the part of the patient. Deglutition was not impaired. Liquids were given in small quantities at frequent intervals. The tongue when extended did not deviate to either side, and was devoid of any tremor. The muscles of the face and neck performed their normal function. The backward and forward movements of the head, also the lateral and rotatory movements, were not impaired.

One hour before death, the line of anæsthesia varied but little from that of the previous day. Priapism slightly marked, less than that on the previous visits. He complained of feeling uncomfortable, and we passed a catheter and drew off sixteen ounces of urine. The pressure of the distended bladder against the diaphragm, interfering with respiration. undoubtedly was the cause of the discomfort. In passing the catheter he did not feel the slightest sensation. When the the instrument reached the sphincter vesicae muscle, it met with an obstruc-

tion. There being no history of stricture, it indicated that the sphincter vesicae muscle was firmly contracted, and consequently not paralyzed.

Another very important point was also noticed in this connection. If the end of the catheter was raised above the level, in the latter part of the act, the urine ceased to flow, but as soon as it was lowered it began to flow again. This would certainly indicate paralysis of the detrusor urinæ. The elasticity of the bladder being alone sufficient to expel the urine when it was completely distended. The temperature had increased to 102 deg. Fahr., respiration 28, pulse 82. He was perfectly rational. Voice distinct, but spoke with greater difficulty and less force. Face much flushed. Respiration very shallow, bronchial rales, throat filled with mucus, and unable to cough or expectorate. Died of asphyxia 43 hours after the accident.

The autopsy conducted by Dr. Pershing 24 hours after death, revealed a separation between the fourth and fifth cervical vertabrae, with complete rupture of all the ligaments and muscles of the right side, and separation to such an extent, that the dura could be distinctly seen. The inferior articulating process of the fourth pressed forward and in front of the superior articulating process of the fifth, lodging in the intervertebral notch between the body and the superior process of the fifth. Thus the interlocking of the articular processes maintained the dislocation producing what Stimson terms, "A complete Unilateral Dislocation."

The cord and membranes were severely compressed between the laminæ of the fourth from behind, and the upper part of the body of the fifth in front; thus compressing them into nearly one half of their former space. The meninges were not torn. No extra-dural hemorrhage. The entire cervical spine was removed and has been preserved. After removing the cervical portion of the spine, by using a little extension and twisting the upper segment to the right, they could readily be displaced, the right inferior articulating process slipping over and lodging in front of the superior articulating process of the fifth. In reversing the order, using counter-extension and twisting the upper segment to the left, the parts went into

position again with a distinct snap, that could be plainly heard for a distance of several feet. After removing the cord and membranes from the canal, the gross lesion showed distinctly where the crushing of the cord had taken place. A distinct circular constriction extended entirely around the cord, at a point corresponding to the lower level of the fourth vertebra, or between the fifth and sixth cervical segments of the cord.

The cord has been preserved in Muller's fluid, and is on exhibition for those who wish to see it. The pathological analysis of the interior of the cord, showing the minute lesions of the cord by transverse sections, has been delayed, on account of not wishing to destroy the identity of the gross lesion. The discovery of the total absence of fracture was also a notable feature of the autopsy.

In this report I have endeavored to adhere, as closely as possible, to the true clinical phenomena. As a rule it is not well to generalize upon individual cases; but the foregoing case being one of such rare occurrence, and the symptoms so typical and distinctly marked, and an autopsy also being had to demonstrate the accuracy of the diagnosis, and the character of the lesion, all combined, is quite sufficient to render it worthy of a brief review of some of the most important points.

In the first place the distinct vaso-motor disturbance, indicated by the flushed face, the slow and feeble pulse, and the marked subnormal temperature, would clearly indicate vaso-motor paralysis, very probably due to injury of the cervical ganglia, situated on each side and in front of the cervical spine.

In spinal surgery, the reflexes are among the most valuable diagnostic signs that we possess, although there is a wide difference of opinion among observers, as to their diagnostic significance. Dr. Thorburn, of Manchester, England, who has made some excellent observations in this department of surgery, claims that in total transverse lesions of the spinal cord both the superficial and the deep reflexes below the functional level of the injury, are permanently and entirely abolished, while in partial lesions, the reflexes are retained, perhaps exaggerated. He further claims that if the lesion causes complete paralysis and anæsthesia, the deep reflexes are always lost.

One of the most important questions in this connection, is the effect upon the spinal centers, by isolating them from their cerebral connections. If there has been no error of observation in this case, I think it will bear me out with the statement, that the functional activity of all the spinal centers below the lower level of the lesion, were totally abolished, with the exception of two: "The sexual reflex center," and "the tonic center of the sphincter vesicæ muscle."

The proof that the first was not totally destroyed is demonstrated by the fact that the local irritation of passing the catheter increased priapism to a very marked degree.

The most plausible theory of priapism is that of Dr. Bramwell (3), who claims that it is probably due to irritation of the "excitor" fibres, which pass from the cerebrum to the sexual reflex center (2). In other words, it is "a reflex act," produced by an irritation of these fibres at the point of the contusion of the cord. From the fact that the local irritation of a catheter increases the condition tends to prove Dr. Bramwell's theory, in opposition to the old one of "vaso-motor paralysis." The proof that the second center was not paralyzed is very evident from the fact of the persistent retention of urine, without any dribbling whatsoever, notwithstanding the fact that the bladder was distended to the degree that the pressure against the diaphragm from below quite seriously impaired respiration.

Dr. Lidell has observed in these cases that retention of urine is almost certain to exist for a time, but to be succeeded by incontinence, as soon as the sphincter muscle becomes paralyzed. (4)

If the inhibitory fibres of the sphincter have been severed or destroyed, any voluntary inhibitory impulse sent from the brain will meet with resistance at the lesion. Consequently, if the sphincter is inhibited after there is total transverse lesion above the tonic center, it must be done by "Dr. Gower's reflex," that is, by sensory stimuli from the mucous membrane of the bladder itself. (5)

But in this case I think we have shown conclusively that both the motor and sensory power of the bladder walls were

paralyzed. Therefore, it seems to me evident, while the tonic center remains in force, the cord being completely crushed above it, that it is, at that time, an independent spinal center, isolated from any cerebral connection.

Dr. Hughlings Jackson has observed that the highest centers of the nervous system, those which are the last to rise in the process of evolution, are the first to fail in dissolution, are the easiest affected by sudden irritation. (6)

Reasoning from this data, the natural inference is, that the "sexual reflex center," and the "tonic center of the sphincter vesicæ muscle" are the most stable centers of the cord, as they are almost always the last to lose their functional activity after total transverse lesion of the cord.

So far as the prognosis is concerned in these cases, there is very little to be hoped for. Dr. Thorburn states that it is hopeless to expect that the crushed cord can recover itself. Some suggest that the two segments might be innervatad by transplantation of the spinal nerve roots, and thereby restore the function of the cord. (8) But this seems to be entirely too radical a measure,increasing the dangers to life, without offering any reasonable chance for improvement.

From the foregoing history, and from a rather careful review of the sparse literature upon the subject, we make the following deductions:

1st. In acute traumatic lesions of the spinal cord, where there is instantaneous and total paralysis of both sensation and voluntary motion the probability is in favor of crushing of the cord, rather than compression.

2nd. When the cord is totally crushed, there being instantaneous and total loss of sensation and voluntary motion below the lesion, there is also total loss of the reflexes. (The opinion of many good authorities to the contrary notwithstanding.)

3rd. When the cord is once completely crushed, indicated by the above symptoms, viz., instantaneous and total loss of sensation, voluntary motion and the reflexes, reduction will not improve the symptoms, and surgical interference very likely only shortens life, without offering any reasonable hope of improvement.

4th. Priapism is probably due to a reflex act, rather than vaso-motor paralysis, or by a combination of both, demonstrated by the local irritation of a catheter.

5th. Usually there is a marked vaso-motor paralysis, indicated by the flushed face, slow and feeble pulse, and marked subnormal temperature, soon followed by hyperpyrexia.

6th. Usually there is retention of urine, to be followed, sooner or later, by incontinence, unless the lesion is low enough to embrace the tonic center of the sphincter, or the associated concussion has been sufficient to impair its function. In either case there is paralysis of the sphincter and incontinence of urine from the first.

7th. It is a characteristic peculiarity of acute traumatic lesions of the spinal cord, that consciousness and the power of speech are very seldom lost, a very important contra-distinction to similar injuries of the cerebrum.

8th. The "sexual reflex center" and the "tonic center for the sphincter vesicæ muscle" are very probably the most stable centers of the cord, demonstrated by their persistence of action after their complete isolation from their cerebral connection.

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DISCUSSION.

Dr. Yocum.—I would like to ask what was the cause of the jar or noise that was heard during extension and counter-extension?

DR. HOLMES.—The inferior articulating process of the fourth vertebræ coming into contact with the fifth, causes friction, and as soon as extension increases this to the degree that the bone of the fourth can return in position, it returns so violently, that it causes the noise. That is nearly always observed in the reduction of a dislocation.

DR. KAHN.—I would like to ask Dr. Holmes if he thinks it possible that by extension and counter-extension there had been any rotation; or if they had tried rotation, if it would have been possible to dislodge it. Do you think it would have been possible by rotation to dislocate it back after making your counter-extension.

DR. HOLMES.—If I had not been able to reduce without rotation, or flexion, I would not have hesitated to use it; but if it can be reduced with extension and counter-extension alone, it is always wise to do so, for rotation or flexion tends to increase the pressure on the spinal chord.

DR. PARKHILL.—Dr. Holmes' paper has reminded me very forcibly of a case which I saw some three years ago at Deer-trail in this state. The individual was intoxicated, his team ran away and he was thrown out of the wagon, falling on his head. I saw him some ten or twelve hours after the injury. He then had a well-defined dislocation of the seventh cervical vertebra, and the symptoms were almost identical with the case cited by Dr. Holmes, with the exception of priapism. My method of reduction was practically the same as that employed by Dr. Holmes. I did not succeed, however, in reducing the dislocation by extension and counter-extension, so I made lateral flexion and rotation as well, and this was successful. I heard no sound when the bones were brought into their normal relationship, but the sensation transmitted to the hand was unmistakable. The injury to the cord was so serious that it resulted in the patient's death thirty-six hours after.

REMOVAL OF THE GASSERION GANGLION.

REPORT OF A CASE.

By Clayton Parkhill, M.D., Denver.

I desire to present the history of a case of excision of the gasserion ganglion, which, at the time of operation, was the first of its kind in the state. There were but three cases on record in America and five in Europe at that time. The case was referred to me at the Arapahoe County Hospital from the service of Dr. Eskridge, and the following history is clipped from the hospital case book:

Mary E. H., age 60; a native of Ireland and married; has been in the United States since her eighth year; in Colorado seventeen years. Family history, unimportant, except that there is a record of rheumatism on the father's side. Health in childhood good and remained so until her twenty-eighth year, three years after her marriage, when she began to suffer from rheumatism. This affected the joints, especially the distal ones of the fingers. All these joints of the right hand are distorted by local deposits except the thumb, but none of the other joints of this hand are affected. The distal joints of the index, middle and ring fingers of the left hand show deposits. The larger joints of the extremities have occasionally been the seat of pain, but none of them except the left ankle are enlarged. From her thirty-eighth to her fifty-second year she suffered considerably with these rheumatic pains. Eight years ago the first division of the fifth nerve on the left side began to be the seat of great pain. Soon after the second division became involved, and three years ago the third division. Eight years ago the second division of the nerve was incised at its exit, from the infraorbital foramen. This gave relief for about five months. A second operation was then peformed, in which all three divisions were excised at their exit from their respective foramina. This gave relief for about five months. A third operation was performed six months after the second. This was similar in character to the others, but confined to the

second division, and gave no relief whatever. After this operation she began to take morphine for the relief of pain. The dose was gradually increased until about one year ago, when she was taking 120 grains per week. She continued to take on an average this amount until her admission to the hospital. When the pain was unusually severe, she would frequently consume 60 to 120 grains in twenty-four hours. This was always taken by the mouth. During the last year she has inhaled chloroform from the bottle almost constantly while she was awake. In the 10 days preceding the operation, she had consumed four pounds of the anaesthetic. At times it has been impossible to obtain more than a few hours sleep in the night. Since her admission to the hospital, she bas been made tolerably comfortable by taking from 12 to 15 grains of morphine hypodermatically. In addition to this she has continued to take chloroform. Her nutrition is fairly good, the urine is free from albumen and sugar. Her face has an expression of suffering and is exquisitively sensitive to touch on the left side. There are no areas of complete anaesthesia, although the left side of the nose and places on the left side of the face are partially anaesthetic. Her exacerbations of pain seem to have their beginning in the inferior division of this nerve. There is no paresis, or paralysis of the muscles of the face. Hearing is fair and equal on both sides and taste seemed to be equally well preserved on both sides. Her temperature prior to the operation, ranged between normal and 101½. Her pulse between 101 and 128.

On September 3rd, which was the day previous to the operation she was given a brisk cathartic of Epsom salts and was carefully bathed. The left side of the head was shaved, and this area of the scalp, together with the entire left side of the face was scrubbed with soap and water, afterwards with sulphuric ether, and finally with a solution of bichloride of mercury (1-1000). Towels sterilized in 1-2000 solution of mercuric chloride, were then placed over the field of operation and confined there by bandages. On the following morning, the day of operation, a rectal injection was administered. Immediately preceding the operation, the patient was given an ounce

of whiskey with 1-30 grain of strychnia. Chloroform was used as the anaesthetic. While the patient was under its influence the cleansing process of the preceding day was again employed. The method of operation was practically that of Rose. The incision began just external to the outer canthus of the eye, and was carried backward along the line of zygoma to a point immediately in front of the ear, thence downward to the angle of the jaw, thence forward along the line of the jaw as far as the facial vessels. This incision was deep enough to sever the skin and superficial fascia. The flap included by these lines was dissected up and turned forward. A dental engine was used to perforate the zygoma at either end for subsequent suture. Considerable embarrassment and delay was caused by the failure of this instrument to work properly. The bone was sawn between the drill holes and turned down together with the masseter muscle. It was found that the opening was somewhat small, owing to the unusual width of the zygoma anteriorly, and it was enlarged with bone cutting forceps. The coronoid process was not drilled, but severed from the jaw together with the insertion of the temporal muscle and drawn upwards. This exposed the pterygoid fossa. The internal maxillary artery was ligated in two places and cut between. Great difficulty was experienced on account of lack of light in the depths of the wound, until Dr. Jesse Hawes suggested the use of a mirror to reflect the sun's rays. This proved quite satisfactory, and the origin of the external pterygoid muscle was now peeled off from its attachment to the greater wing of the sphenoid. The foramen ovale was located, and a half inch trephine was applied anteriorly and external to it. On the removal of the button, the intervening bridge of bone between the trephine opening and the foramen was cut away with the chisel and mallet. The inferior maxillary division of the nerve was now followed into the skull. It was impossible now to see the gasserion ganglion, but passing a small curette along the nerve to the location which the ganglion should occupy, it was scraped away. The wound was flushed out with sterilized water and the parts brought again to their normal relations. Instead of reuniting the coronoid process to the jaw, it was cut

away. The zygoma was not united to the bones but was simply sutured to the temporal fascia. I believe this was the first time that this proceedure had been made use of, and the result was so satisfactory that I shall hereafter pursue this method. The time saved from drilling the zygoma and introducing the sutures is very considerable, and if equally good results can be obtained by suture to the fascia, it will certainly tell in the patient's favor. The skin wound was united by interrupted silk sutures. No drainage was used. Small pieces of protective were placed over the wound; over this a few layers of sterilized gauze and this covered by an abundant dressing of simple sterilized gauze, and over all sterilized cotton and a bandage.

The patient reacted well and her progress to recovery was uninterrupted. The pain was completely and permanently relieved. The temperature on the evening following the operation was 101 2-5 the next morning 99 4-5 and from that time it rapidly declined until the third day following the operation, when it was normal and afterwards remained so.

On the seventh day the wound was dressed and found perfectly healed. The morphine was gradually withdrawn until the fourteenth day, at which time she was taking ½ grain per day. On this day she was discharged from the hospital. Up to the present time she has not experienced the slightest return of the pain. Ten months is not sufficiently long in which to estimate the permanency of the result obtained by this operation, but if the good following it is in proportion to the difficulty of the proceedure, there can never be cause for complaint.

DISCUSSION.

Dr. Hawes.—I have taken a deep interest in the result of this case. It was originally one of mine, and I had pretty nearly given up the patient to die, and in effect had suggested to her that I would like to make a *post-mortem*. I met the patient a few days ago, and as far as the neuralgia is concerned she is entirely relieved; she is still to a small extent a morphine eater, but does not take more than one and a half grains a day.

Dr. Parkhill did not enter into a discussion of the rarity of that class of cases. At the time this operation was performed

it was the first in this state. There were one or two cases reported in Kansas City, two in Chicago, and five in London.

I would like to add what testimony I can to the success of the operation, and I would suggest to members that if they have any similar cases they might, for the best interests of the patient, place the person under the supervision of Dr. Parkhill. Though this operation is a very difficult one, it is less so than the old one of passing through the antrum of Highmore. It is difficult for the operator to get light into the cavity in order to recognize one tissue from the other. But having seen one case and the beautiful results following it, transferring a hell on earth into a heaven, I would urge the members without experience to send their cases to Dr. Parkhill.

Dr. Edmund Rogers congratulated Dr. Parkhill on the success of his case and spoke of the great difficulties and dangers attending the operation. No one could realize the extent of the details and difficulties attending the operation who had not actually undertaken it on the living patient.

Dr. Rogers then exhibited a case on whom he had operated by the same method on May 23rd last in St. Luke's Hospital. The result was in every way satisfactory. The patient had suffered from an intractable trigeminal neuralgia for eight years without any continued relief. Extended account of this case is omitted here as it is reported in full in the current journals by Dr. Eskridge and Dr. Rogers.

CONSERVATISM IN ACCIDENTAL SURGERY.

By Edmund J. A. Rogers, M.D., Denver.

Few cities with the same hospital accommodations as Denver have as large a number of severe accident cases. This probably applies even more to gunshot than to other injuries, but all classes of accidents are common. For no class of cases

has modern surgery done more than for accident surgery, and in no department of surgery is it more essential to have as full a knowledge as possible of the process of natural repair in tissues and of the means through which infection takes place. To be able to judge of the probability of infection in any given case, means often to the patient the difference between a few days' indisposition and, perhaps, the loss of his life.

All will admit that unnecessary handling, manipulating and dressing of wounds is most detrimental to their repair. The simple handling of a wound destroys thousands of cells whose vitality may have been deprived, but which have not been necessarily destroyed. And if handling dooms so many, how many more are destroyed by the indiscriminate, wholesale application of poisons to them in the shape of antiseptics? I am not by this assailing the use of antiseptics, far from it; but their abuse. I cannot but consider the application of strong poisons to injured tissue cells, or to rapidly developing embryonic cells, such as we find in granulation tissue, to be about as bad surgically as the neglect of the use of an antiseptic in a wound which is suspected to be infected.

Scientific surgery is the ability to judge just when to use them and how far to go in their use. Beyond question, what is to be desired is nothing more than the complete practical disinfection of the wound; that is, the removal or destruction of such infecting material as may be deposited there and no more. All beyond this is injuring the parts. If there is no infection the use of any disinfectant simply poisons the parts. If we can remove the infecting material mechanically, as by simple water irrigation, we gain just as much as the life of all the superficial cells is worth for the repair of the wound. If we must use an antiseptic then we should use the one which best destroys the infecting material and does so with the least damage to the living cells.

Simply, the object of the first dressing of the wound is to place it in an absolutely aseptic condition, so that we may then protect it from further infection and allow the natural reparative process to go on undisturbed. If our wound is aseptic and protected from infection we need have no concern for dead

cells, for dying tissue, for detached portions, for blood clots or other dead matter. Indeed a reasonable amount of dead matter acts as a good matrix in which repair will go on. I realize no greater mistake than that sometimes made of trying to remove the dead and dying tissue from an injured part. Dead tissue that is infected must, of course, not be left in a wound unless all infection is destroyed. Parts that are torn and far separated must be brought into reasonable, normal relationship; but even this is more apt in severe injuries to be overdone than left undone. Keep the wound free from infection and the natural process of the tissue cells will work wonders. In the majority of injuries I doubt much if anyone can tell just what cells will live and what die, and so attempts to remove all dead tissue, even if it were desirable, must be futile, and, worse yet, must destroy countless cells that would otherwise live by damaging the much impaired blood vessels supplying the injured parts.

The great question then is the one of first dressing in all injuries, but I can attempt to give no definite rules for the application of this dressing in the limits of a paper read here. The combination of conditions that influence our technique is so varied that the same will hardly occur twice in a lifetime. Some of the conditions that we must always be informed upon before we can rationally decide upon our mode of dressing are: The substance producing the wound, the way the wound was made, the amount of bleeding after it, what has come into contact with the injured parts since the injury, the condition of the skin before the injury, and the time since its occurrence. The number of conditions that bear upon this point seem endless, yet how we shall treat any one particular wound must be determined by the answers to many such questions. In one wound we would hardly use sterilized water, while in the next it might seem wise to use even a 1-500 bichloride solution. The question always is how little antiseptic and how weak dare I venture in this? And you may rest assured that, other things being equal, the less poison you apply to a wound the better your result will be. Do as little as you can safely to get rid of infection, then guard against it and let the wound alone.

One class of wounds which a general rule seems to reach

are bullet wounds. A bullet wound is practically always a non-infected wound, and should, therefore (with too few exceptions to mention) be let absolutely alone. The bullet probe and over enthusiastic wound irrigation and drainage are responsible for much of the mischief laid to the gunpowder. Of course this does not apply to those cases where the indications are positive for operative proceedings, such as to sew up intestines or ligate large vessels. Burns also are, from their nature, always aseptic wounds, and should be so treated; but they are, of course, most liable to early infection. There is no better and more thorough cleanser of a wound than a good free hemorrhage from its deepest parts. All infecting material is mechanically removed and the wound filled and sealed by a mass of dead tissue which can only be infected from its exterior. Pure water can often be made to do the same cleansing service, for when a wound is treated immediately and there is only a suspicion of surface infection it will mechanically remove it with safety and so save us from poisoning our tissues. Many injuries are so extensive as to entail the ultimate destruction of much tissue dependent upon the part injured. The operation for the removal of these parts was formerly considered best done immediately. Not so in modern surgery. We can now generally protect the parts from infection and so the patient from danger, and wait for reaction from the depressing effects of the injury on the constitution of the patient, and for distinct lines to form to guide us in the extent of our operations.

Having freed our wound from infection and protected it with a thorough dressing, what shall we then do? Await developments. No definite, general rules can be laid down for a future course. In some wounds it will be found best to reopen and redress them in a few days; but if no infection has taken place the longer we can leave them the more satisfactory will be the results. It is a definite axiom that no wound can be dressed without some danger and some harm being done to it. We have all learned to strongly condemn meddlesome midwifery, but modern developments teach us that meddlesome surgery is much more common and quite as dangerous to humanity.

I shall now briefly review a few accident cases illustrating these principles as applied to the different classes of cases. First, illustrating the milder class of injuries, I shall speak of three glass cutting wounds, which have recently come into my hands. I do not select for special results, as the results given are the average results obtained in these cases.

S——, a small boy, while playing in an alley on May 14, fell on a piece of glass which made a deep cut down the bone just exterior to the anterior superior spine of the ilium. The wound was about two inches in length. I saw him within an hour and took him to St. Luke's Hospital, where, after a thorough cleansing of the skin, I washed the wound out with a bichloride solution (as infection was almost certain) and then with sterilized water. I stitched it closely with sterilized silk, and applied protective and sterilized dressing. Upon removing these I found union complete and perfect, not even the stitches showing any sign of inflammation.

On June 10, A——, a little girl, slipped on some steps and broke a tumbler under her, cutting the buttock entirely across, the wound beginning about one and one half inches external to the anus, and extending outwards and upwards. The force was exerted upwards so as to cut through the gluteal muscles, almost parallel to the skin, making a wound about four inches deep. This I saw about two hours after its occurrence, when I took her to St. Luke's and dressed it in the same way. I removed the dressing on the 16th, Saturday last, and found union perfect and satisfactory, There was, however, more redness about the sutures than in the last case, which was probably due to the impossibility of keeping the parts at rest.

Frank B., a stoker in one of our largest restaurants, fell forward into a pile of broken glass on June 8th. I was called to the hospital to help catch the deep bleeding vessels, but a tourniquet had controlled them before I got there. The wound extended across the inner base of the palm from a little external of the medium line in the thenar eminence inwards around the hand to about the styloid of the ulna. It extended so deeply that the articulation between the carpal bones lay open. It had been washed and handled much and it was difficult to

distinguish the various structures. I passed buried sutures to bind the deep parts in their proper positions and then united the skin. The little finger was without sensation for the first few days but soon began to improve. It was dressed yesterday and all found satisfactory. Within a week after this report recovery was complete and perfect.

Now, to state briefly, a few severer cases:

H. was kicked by a horse low in the center of the forehead on Nov. 5th, 1892, and the skin and tissues torn and the bone crushed in. As the symptoms seemed threatening I at once operated. It was not necessary to trephine entirely through the bone as the pieces were easily removed when loosened by the instruments. Quite large pieces of the external plate were removed, and as the internal plate fractures were over the longitudinal sinus and were too low to affect the brain, they were not disturbed. The wound was closed, dressed, etc., as in the above, and the patient left St. Luke's Hospital well on November 18th, having been there thirteen days.

The next case is that of Henry S., aged 18, who on March 28th last fell 25 feet from a building, landing head foremost in a pile of rubbish. The forehead was torn badly, and the frontal bone was extensively crushed in. He was taken to the County Hospital in an unconscious condition. I did not see him for some hours, and then, finding him doing well and that he had been properly cleansed and dressed, I did not uncover the wound. I did not touch it until all immediate symptoms of the injury had disappeared, which was on the third day. The laceration and displacement of the upper forehead tissues was very great, and the bone extensively depressed. This was all replaced and the skin adjusted. Recovery was complete and satisfactory with the exception of a stitch abscess which kept him in the hospital, as a precaution, for a longer time than usual.

The next case of head injury I show you here. He was crushed by falling from a train thirteen days ago. His case is of both surgical and neurological interest, and I shall, with Dr. Eskridge, report it more fully later. He is here for inspection.

I shall now summarize for you two deep puncture wounds, both patients of the county hospital.

First, that of a young man, Lawrence M., stabbed on March 29th just along the diaphragm of the left side. Had the knife not gone upwards it would have been an abdominal wound. Air pumped in and out with every respiratory movement. It was probed to find the direction of the wound and no more. It was then immediately sealed and recovery was rapid and uncomplicated.

It was not, however, so rapid as in the case of an old man, Slater, over 70, stabbed at the county poor farm, on April 14th with a tobacco knife. The liver was deeply punctured just below the cartilages, about six inches to the right of the median line. Hemorrhage had been very profuse at first. A probe dropped into the wound directly backwards and so I believe it was confined to the liver alone. I filled the external wound down to the liver only with sterilized gauze and dressed it, awaiting developments. The only development was the rapid and uncomplicated recovery of the old man, he feeling quite well again within a week.

I shall now take up the more interesting subject of gunshot wounds.

First, I shall speak of two penetrating wounds of the chest, both attempts at suicide and both attempts to pierce the heart. The first I associate with the second, not in point of time as it occurred several months ago, but on account of its great similarity to the second. This was a young girl, H—— J—— who shot herself in the second interspace about two and one-half inches to the left of the mid-sternal line. It was difficult to realize how the bullet in its direct course backwards passed all structures of vital importance. The house surgeons, not then so familiar with our present technique, placed a drainage tube through the large orifice of entrance, and frothy blood and air pumped in and out with each breath. I removed the tube, cleansed and sealed the wound, and the patient left the hospital in nineteen days quite well. The bullet was cut from under the skin between the scapula and spine, having passed almost horizontally through the left lung.

The second case was in a much older woman, Nora W., who was taken to St. Luke's Hospital during the past year. In this case the bullet also passed through the thorax horizontally, coming completely out behind. The point of entrance was just internal and below the heart apex. The point of exit horizontally parallel to the middle plane of the body directly at the back. It must have torn the diaphragm and it was hard to realize how it got past the heart ventricle. The tissues about both wounds were cleansed and the wounds sealed at once. There were symptoms of pulmonary congestion, but the patient left the hospital well in thirty-three days.

The case of J. B., a deputy sheriff, aged 44 years, was of still greater interest. On the night of January 31st last, he dropped his 44 caliber revolver. Falling on something behind him it went off, the bullet entering the thigh at about the junction of the lower two-fourths of the femur with a downward direction. The bone seemed completely comminuted and the condyles separated, and both quite loose, the bullet apparently passing out between them and on through the joint escaping through the center of the ligamentum patellæ just above its attachment to the tibia. The skin wounds here, together with all the surface about them, were thoroughly cleansed and disinfected; the wounds were sealed and dressed and the leg fixed without extension. The dressings were altered on the seventh day. The leg was subsequently put in plaster and kept absolutely at rest for over three months. In eight days the evening temperature fell to 99. and remained practically normal from that time on.

He left the hospital about a month ago without giving notice to any one, and I have not seen him since. He was then walking on crutches, putting considerable weight on the knee, in which there was very fair, but somewhat limited motion. The leg still swelled a good deal, especially in the knee. I had then every reason to expect even more satisfactory results in the course of time.

L. C., a school teacher, aged 27 years, while on the train coming to Denver from the East on February 9, 1893, attempted suicide by shooting himself in the brain with a small

calibre pistol. The wound was on the right side over the upper temple, the course of the bullet being transversly across the brain. He had been dressed on the road, but on arrival at the hospital I disinfected and cleansed the wound and found that the bone was exceedingly comminuted. As he showed some symptoms of shock, but no urgent local symptoms, I dressed the wound and gave him time for recovery. Improvement was so rapid and satisfactory, the temperature falling to normal on the sixth day, that I did not remove the dressings until the eleventh day, when I found the skin completely healed. I, however, incised freely down to the bone, and found that the skull was spiculated to a circle at the point of entrance, the pointed spicules penetrating through the dura into the brain. A large amount of necrosed tissue showed the course of the bullet to have been across the very anterior portion of the frontal lobe; beyond that the bullet was not traced at all, but was allowed to remain at rest, probably within the skull. The irritating points of bone were freely removed aud the wound dressed. A small drainage aperature, however, was left until the next dressing, the patient left the hospital apparently in perfect physical and mental health on March 5th.

The next case I shall mention rather as a surgical curiosity than otherwise.

I was called to the County Hospital in April last, to see a man shot through the chest, about the apex of the heart. On examination I found a rather large, lacerated wound directly over the apex. The heart's action was much disturbed, but the symptoms were hardly serious enough to be in keeping with such a desperate injury. On close examination I found the entrance wound somewhat elongated, extending down to the rib but without any deeper penetration. On asking for the patient's clothes for examination I found that the bullet had passed through a heavy flannel shirt, in which there was a pocket over the left breast, just external to this pocket; but no orifice for the escape of the bullet was visible. However, on handling the shirt further, I shook the bullet from the pocket and then found that in coming outwards its force had only been sufficient to carry it into the pocket without penetrating

the outer layer of flannel. The bullet had actually been caught in the pocket of the shirt. I need hardly add that the patient left the hospital in a few days quite recovered.

THE EARLY TREATMENT OF CLUB FOOT.

By George B. Packard, M. D., Denver.

The treatment of club foot is a very extensive subject, and it is my purpose in this paper to consider only congenital cases which come under observation soon after birth or during the first year of life. I shall not, therefore, refer to the neglected and inveterate cases; nor to the operative treatment, such as tarsal resection or the use of extreme force that sometimes becomes necessary in their treatment. The time allowed for a paper of this kind would be insufficient to do justice to the whole subject. By club-foot I refer to *talipes equino-varus*, the other varities of talipes not being included. Many of our best writers put only this variety under this head; it is the one we have mostly to deal with and is popularly known as club-foot Dr. Bradford, in his excellent work on orthopedic surgery, describes this deformity anatomically, as a dislocation inward of the anterior part of the foot, the dislocation taking place at the medio-tarsal articulation, the skin, muscles, tendons and fascia being affected by the abnormal position, and the scaphoid bone found articulating with the side of the head of the astragalus, rather than with the anterior surface. In these cases we are dealing with bones in a cartilaginous state, therefore the muscles and ligaments will offer the most resistance in correcting the deformity, and consequently the methods of treatment differ from those adopted in older cases. Text books are very misleading in regard to the results obtained in the treatment of club-foot. We are led to suppose that many more cases are thoroughly and permanently cured than is really the case; also

that the treatment is comparatively simple and the recoveries easily accomplished. Such, I believe is not the case. Although there has been great progress in the treatment of this difficulty during the last ten or fifteen years, yet the number of cures actually accomplished is probably much less than is generally realized. This is due, in the first place, to not thoroughly carrying out the principles of treatment and completely overcoming the deformity; and, in the second place, in not properly carrying out the after-treatment, of returning the foot in its corrected position for a sufficient length of time. The tendency is to only partially overcome the deformity, or to attempt to overcome the whole deformity at one time. A relapse is almost sure to take place, and the little patient is frequently taken from one surgeon to another. The after-treatment, in retaining the foot in its proper position, is quite as important as the correction of the orignal deformity. We may have different methods for treating this deformity, but if the principle is correct and the treatment carried out a sufficient length of time, we ought to have satisfactory results. The first question that arises is how soon after birth should treatment be commenced in case of congenital club-foot. While authorities differ somewhat in regard to the time tenotomy should be performed they are quite unanimous in the opinion that other methods of treatment should be commenced in all cases, within a few weeks after birth. When circumstances permit I usually begin treatment in ten days. Unfortunately treatment is dedelayed, in many cases, for a long time through mistaken advise, or negligence on the part of parents. The object of treatment being to correct the deformity, and to retain the foot in its corrected position for a sufficient length of time to preclude the possibilitiy of a relapse, the next thing to be considered is the best methods for accomplishing these ends, methods that are simple and at the same time efficient. I wish to emphasize the great advantage of dividing the operation for overcoming the deformity into two steps,which has been recommended by different writers on this subject; viz: 1st, correction of the varus; 2nd, correction of the equinus. If one adopts this method of procedure, I think he will be convinced of the advantage of leaving

the tendon Achilles to steady the heel and act as a counter force in overcoming the resisting fascia and ligaments of the inner side of the foot until the varus is completely overcome or even converted into a valgus. There is a temptation to attack the equinus before the varus is relieved, and even to attempt to reduce the two deformities at the same time. The result generally is, that the resistence at the inner side of the foot is not completely overcome; and we are deceived in regard to flexion of the foot, more flexion apparently taking place than is really present when the varus is completely overcome, and the tendency to relapse is greatly increased. As a rule, in these early cases, I find the varus can be relieved by mechanical methods alone; but, in some cases, it may be necessary to divide the plantar fascia, the tendons of the tibialis anticus and posticus and in some cases the astragalo-scaphoid and calcaneo-cuboid ligaments. One of the simplest and best methods of correcting varus is the repeated application of plaster of Paris. It is better to administer an anæsthetic, then grasping the foot firmly, overcome the varus as much as possible without interfering with the circulation of the foot. While the foot is held in this improved position, apply the plaster of paris; and by using Johnson & Johnson's prepaired rolls, it will only be necessary to hold the foot in position for a few minutes, as it sets so quickly. The plaster should extend above the knee and the latter should be slightly bent to hold it more firmly and prevent the foot from rolling in the cast. This should be allowed to remain about ten days, when it should be removed and another plaster applied, in the same way after the foot has been forced into a still more correct position. Three or four applications are generally sufficient to overcome the varus. The advantage that this method has in performing the first step of the operation is, that it is something that every physician has at his command, and no great skill is required in carrying it out. Another very satisfactory method for relieving this part of the deformity is by applying a simple steel support, which acts as a lever to throw the foot into position, and can also be worn to keep the foot in position after correction. The brace I show you, I have used with satisfaction in overcoming the varus and

as a retentive apparatus. It is a modification of the Taylor shoe. It consists of a flat steel plate corresponding to the shape of the foot. and at right angles to this rises an inner border, to which is attached an upright, allowing forward motion at the ankle point. A little higher there is another point allowing lateral motion, which is regulated by a strap attached to the outer border of the foot plate, and extending to the band which encircles the leg below the knee. After the foot has been properly strapped to the foot plate and the upper end of the upright fastened to the leg below the knee, the outer border of the foot can be raised to any degree by tightening the strap, which extends from the foot-plate to the band. As the tissues relax on the inner side of the foot, this strap should be shortened. This constant stretching will soon correct the lateral deformity. This apparatus is simple and can be made by any instrument maker and easily applied. It may be more satisfactory in some cases than the plaster of Paris. The first step of the operation being thoroughly accomplished, the next step is to bring down the heel or to overcome the equinus. In many cases we shall find that the tendo-Achilles has yielded a great deal while correcting the lateral deformity, and it only requires a little more extension by the means already alluded to, in order to complete the operation. If it offers much resistance, it is better to subcutaneously divide the tendon and bring the foot into position at once. As I remarked before, there is great danger of a relapse in these cases, consequently the after-treatment is very important. The foot should be held in its corrected position for a sufficient length of time for new facets to form on the bones in their new positions and become normal. The retention apparatus for maintaining the foot in this position should be worn day and night, and should permit of motion at the ankle point. The simple apparatus that I have already described answers every purpose; and as it is worn inside of the shoe, it can be kept on nights as well as days. Massage and electricity are useful means for developing the muscles after the deformity has been corrected. In these cases, little time would be gained by performing tenotomy, before mechanical treatment has been resorted to, and the

disadvantages are apparent. It will be necessary for a child to wear a retaining support for a long time, in all events, and if it acts partly as a correcting force, we are not consuming any extra time by this apparently slow method. It is an error to suppose that tenotomy alone will cure club-foot in a few weeks. Cases that are supposed to be cured in this way, without additional mechanical treatment being carried out, invariably relapse; therefore, I believe a judicious continuation of the operation and mechanical treatment alone will suffice. In conclusion, I would emphasize the following points: 1. The importance of beginning treatment as soon after birth as possible. 2. Thoroughly overcoming the varus before attacking the equinus. 3. Retaining the foot in its corrected position both day and night, without interfering with the normal functions of the foot, for a sufficient length of time to prevent a relapse.

DISCUSSION.

DR. MUNN.—I should like to ask the doctor, the very earliest date which he would consider it permissible to resort to operation in extreme cases?

DR. PACKARD.—In this class of cases, I prefer not to operate until the child is nearly ready to walk, so that the muscles will be used very soon after the operation. In mechanical treatment, it should be done at once.

DR. PARKHILL.—I recall a few cases of congenital club-foot which I have seen within the last few years. I have treated them on a line a little different from that indicated by Dr. Packard. Treatment was begun on the second or third day after birth. Simple strips of adhesive plaster were made to take the place of the weak groups of muscles, so as to correct the equinus and varus. An ordinary roller bandage confined these in place. The dressing was frequently changed, the parts carefully bathed and the affected groups of muscles massayed. This method gave me excellent results, and I consider it less troublesome than the plaster of Paris, and less expensive than the admirable apparatus that Dr. Packard has shown.

DR. PACKARD.—I would simply say that I have used the plaster as mentioned by Dr. Parkhill, and find that it works

very well in mild cases. In other cases, I do not think it works as well as the plaster of Paris and steel support.

AMPUTATION.

By Geo. W. Meil, M.D., Denver.

Amputation, more particularly primary amputation, with especial reference to mechanical injury; furthermore, amputation in the lower extremities.

Apparently narrowed, we have still to deal with the larger proportion of amputations. By mechanical injury I mean railway, factory, mill, mine and quarry injuries, and others of similar nature. Dealing with these, this paper resolves itself into the question: When to amputate? How to amputate?

When to amputate. Though not of large career, I trust I may be permitted to offer and emphasize points of importance bearing upon amputation, culled from experience as a post graduate teacher, upon the mechanism of the subject, and as well an extended railway hospital responsibility.

During our late great wars the average mortality of amputation summed some fifty per cent. This was largely attributed to exposure, but more immediately to the then common complication of gangrene or erysipelas, with pyæmia or septicæmia. Before the introduction of antiseptics pyæmia destroyed the life of almost every patient suffering compound fracture brought into a hospital. Amputation was a routine practice to prevent blood poisoning, and was supposed to offer the only chance for recovery. The present limits to which amputation in compound fracture may be resorted to are exceedingly limited.

In hospital practice of today the mortality of major amputations approaches some four per cent. This is owing to better knowledge of the subject, better facilities, but especially to the carrying out of a strict antiseptic system. Without the hospi-

tal, however, a different condition prevails, and to some extent naturally must prevail, which operates to the disadvantage of the subject of an operation.

What are the conditions which operate to the patient's disadvantage unnecessarily? Foremost, unfitness of the operator, because inexperienced. It is of great importance that the physician understand the conditions of amputation, for reason that it forms an emergency and must be properly dealt with. Though he outline for himself a purely medical career, he must nevertheless supply himself with instruments to cope with these emergencies—for moral effect, if for no other purpose. The great mass of medical graduates, after receiving diploma and license, turn at once to private practice, satisfied—for some years at least—with this fund of clinical knowledge. Assuming they have availed themselves during their college years of clinical advantages, how many major amputations have they seen? Perhaps some five or six, and of these they have imperfect recollection. In their own practice henceforth they may infrequently encounter a case, or assist in the case of another. These, however, are too far apart to be carried well in mind, and as work of other nature presses and occupies, the physician generalizes and is satisfied by an occasional peep in a compend or text book, more especially to refresh or impress a particular form of amputation. Today, fortunately, post graduate courses are open to these practitioners; who, feeling the necessity, and availing themselves, may become more adept and give their future patients the benefit of better skill. Demonstration alone upon the cadaver, under an experienced instructor, does much for us, but is insufficient. We must each and all handle these tissues and take individual responsibility of operation—the same operation perfectly repeated—to insure anything approaching ability in real operations for ourselves. Suppose a novice in tailoring were carefully instructed how to cut a suit, would we feel like entrusting expensive material to him in the very beginning? How much more necessary then that the living tissues of a human being should be invaded only by one properly competent.

What is our sum of experience? Safe to say unsatisfactory

stumps. A knee amputation at the hands of a novice too often means resection or reamputation. If lacking, one way to make ourselves more competent will be to embrace all opportunities to see these cases from first to last. If you learn nothing from the operator you learn something from the case.

Today surgery surrounding amputation is distinctly conservative. Antiseptics have worked a revolution and statistics of the past are useful to us only for reasons other than involving mortality. A surgeon worthy of the name will be more proud of one limb he has saved than nine he has amputated. In spite of this, if the future be judged by the past, a certain proportion of younger surgeons will feel it necessary to pile up a few amputations to their credit, if nothing more than fingers.

In amputation the great question is of judgment. We are called upon to exercise it in its highest degree. While justified in taking chances to save limbs, we must well consider the possibility of greater loss through complication—even of life. Our first consideration should be for life, our next for usefulness and comfort.

When a limb has suffered great injury which raises the question of amputation, combat shock, care for injury, get part into aseptic condition, and have consultation. In case of a minor we have not the right to operate without the consent of parent, guardian or relative; unless danger be too great—then call counsel and go ahead. Weigh well the nature and extent of the wound; also the complication; also the circumstances surrounding the case; age, condition of health, means, occupation, etc. If in doubt, give your patient the benefit of the doubt and do not operate.

A wounded vessel of great importance, a fractured bone—even badly comminuted, as from gunshot injury, a perforated joint, a considerable separation or loss of integument, in themselves do not necessitate amputation. In combination, however, they may call for it as the wiser proceedure to preserve the utility of a limb, or may necessitate it for the preservation of life, or as offering the better chance for life.

In simple perforation of the brachial, femoral or popliteal artery, we commonly have a resource in ligation. Wounds

dividing the femoral or brachial artery, because superficially situated, are more often simple or uncomplicated. Injuries dividing or penetrating the popliteal artery are on the contrary severe and complicated; this through force of circumstances, the bone suffering concomitant injury. Indeed the artery is more often ruptured by bone fragment from within than by direct force from without, which could only be inflicted posteriorily. In four instances of rupture of this vessel I have encountered this cause twice. In dealing with this injury ascertain as nearly as possible the exact nature of the lesion, enlarge external wound and expose vessel. If the artery is ruptured, pulse below will be feeble or lost and the popliteal space will be occupied by hemorrhage clot, which, added to other coincident swelling, will give increased constriction in the circumference of the knee and endanger or suspend the anastomotic circulation. If injury be not too great, the clot turned out, the vessel properly ligated, the wound properly treated antiseptically and closed only as far as necessary, permitting relaxation and provision for free drainage, the knee enveloped in antiseptic wool to encourage dilatation of anastomotic vessels and guard against pressure, our patient has a show to retain his leg. In such cases we must keep the patient and his wound under our frequent scrutiny, that at the first sign indicative of gangrene or erysipelas we may resort to amputation. Our delay otherwise jeopardizes the life of our patient. For great injury at the knee associated with rupture of the popliteal artery, our only resource is amputation.

Compound Fracture.—Where we are dealing with a bad comminution in the shaft of a bone which nevertheless permits circulation in the parts beyond sufficient to maintain vitality we should make an effort to save the limb and its function. Our measures in some instances will call for removal of certain bone fragments and arrangement of others; or perhaps removal of all fragments, section of irregular ends of bone and effort at reunion, occasionally at expense of length of part. In certain instances failing in this we may allow an interspace without bone, as in the arm, and still retain a useful and shapely member; or if advisable may attempt bone graft.

Morton cites the old method of treating compound fracture as placing the parts at rest in the proper position and hope for the best. His present practice is to reduce a compound fracture at once to a simple fracture and exchange uncertainty for certainty. The tissues are incised if necessary to enlarge the original wound, ends of bone exposed and trimmed, all fragments removed, wound washed out, ends of bone adjusted, soft parts brought together by suture, lip of wound covered by several pieces of protective to prevent excoriation, and antiseptic dressings as with other wounds.

In 1890, Dr. Frederick S. Dennis, of New York, read a paper by invitation before the Philadelphia County Medical Society, a report of which is printed in the Medical News, April 19, 1890, upon the treatment of compound fractures, based upon an analysis of 1,000 cases under his own observation in hospital and private practice, between the years 1880 and 1890. The general summary in the 1,000 cases is as follows:

Skull	198
Nasal, molar, maxillæ and patellæ	89
Arm	40
Forearm	41
Fingers and toes	97
Ilium, clavicle	2
Thigh	87
Leg	295
Fracture involving shoulder, elbow or wrist joints as result of disease or accident	39
Fracture involving hip, knee or ankle joints as a result of disease or accident	85
Fractures involving carpal or metacarpal, tarsal or metatarsal joints as a result of disease or accident	47
	1,000

Sixty cases necessitated primary amputation. Excluding cases requiring amputation no mortality has followed Dr.

Dennis' treatment of compound fracture in the leg or thigh. In 171 cases of compound fracture involving joints, the joint in nearly every instance has been restored to its proper function. There was no septo-pyæmia.

Dr. Dennis attributes his success in treatment to closest attention to minutest detail in each individual case. In as much as compound fracture has heretofore been the largest contributor to amputation, and because of his unparalleled success, I give his direction in abstract.

"The fate of the patient suffering compound fracture often hangs upon the surgeon who first touches it. Antiseptic irrigation should be practiced before the temporary antiseptic dressing and splint are applied. Patient's transportation to be carefully and comfortably carried out; much being dependent upon these circumstances. Arrived at destination, home or hospital, the first and aseptic dressing will largely influence prognosis; should be done in operating room because of germ-laden air of ward. The instruments, etc., submerged in 1 to 40 carbolic acid solution, towels wrung out in 1 to 500 bichloride solution; wound to be kept covered by antiseptic gauze while limb is washed with soap and water, shaved and irrigated. Upon the limb is then poured a saturated solution of napthalia in ether. Wound itself is now given attention; all blood and debris washed away by stream of 1 to 4,000 bichloride solution —thoroughly irrigating interior; hemorrhage is to be arrested; loose pieces of bone not attached to periostrum removed; all pieces of fascia, faulty tissue, muscular shreds, and lacerated integument should be cut away with scissors and then a final ablution made. The drainage tube should be introduced into the bottom of the wound, and if wound is so situated to draw well, there is no neceesity for counter opening. Tube then cut off flush with skin and fastened by safety pin. Wound now closed by cat gut sutures, which conclude the operative technique. Towels should now be changed, clean ones substituted. The limb is now in readiness for application of the antiseptic dressings. As a rule this dressing can be done without anæsthesia, but when the injury is extensive it is necessary to adimnister ether, the dressing to be completed while the patient

is under its anæsthetic influence. The fragments of bone can now be adjusted, and if displacement is great a silver wire can be introduced to keep them in place. It may be necessary to supplement the wire by deep cat gut sutures carried through the muscles. Deep sutures are necessary in all extensive and gaping wounds of the soft parts, especially when the biceps, triceps, or the quadriceps extensor are divided; these sutures independent of the superficial set. Such wounds require free drainage and counter opening.

In another class of cases, where the wound is very small, a different plan should be adopted. Irrigation should be made around and in the wound, and it can then be hermetically sealed by sprinkling iodoform over the perforation, and painting styptic collodiom over the iodoform, and then irrigating with an antiseptic solution. This mixture will soon coagulate, and the medium of sealing is surgically clean, and then the fracture is ready for antiseptic dressings.

Having completed the operative tecnique the parts are now prepared for antiseptic dressings. Iodoform gauze or a small piece of protective should be placed over the wound, with a hole cut in it to allow the mouth of drainage tube to drain into the dressings. Iodoform gauze is used because bichloride guaze irritates the wound. The bichloride gauze is next applied in loose pieces over the iodoform gauze and around the wound. This dressing is moist. The loose and wet gauze is held in situ by application of a moist bandage; over this a deep dressing of absorbent cotton is placed and retained by a dry bandage. The last dressing is a means of securing equitable and uniform compression around the limb and over the fracture; the cotton accommodating itself to the swelling of the part in the vicinity of the fracture. This part of the dressing is a very important means of preventing inflammatory swelling and of affording comfort to the patient. Four strips of sheet iron about an inch in width are now adjusted; one strip is passed down upon the posterior part of the limb, over the heel, and upon the sole of the foot; two strips are placed on the sides of the leg, and one upon the front of the leg and bent so as to conform to the dorsum of the foot. Over these rolls plates of

Paris bandages are now applied, and the dressing is completed. The strips prevent backward, lateral or forward displacement, and do away with the necessity for a heavy splint. In three days a fenestrum is cut over the wound and under continuous irrigation the drainage tube is removed. In treatment of compound fractures no splint should be left on over eight days."

In 1884 Dr. Dennis called attention to tenotomy as a proceedure in treatment of compound fracture, especially in oblique compound fracture. Tenotomy relieves at once any contraction of the muscles, permits the fragments to be placed in accurate coaptation, and secures physiological rest to the fracture. It affords also great comfort to the patient, and is a valuable means of fixation during the first ten days; finds posture a useful means of overcoming spasm, indeed all that is required. Regards the horseshoe tourniquet a most valuable instrument to overcome longitudinal bone fissure. Regards fluid blood and clot, if perfectly aseptic, valuable adjuncts to repair, though anything short of absolute surgical cleanliness will convert them into dangerous agents of infection. In all fracture dislocations the joint should be immediately rendered absolutely aseptic by thorough irrigation. The drainage should be entirely across the joint, otherwise a pocket for the retention of inflammatory exudates is sure to form in the fold of the capsule. These products under certain conditions are sources of great danger. A careful study of cases of fracture-dislocation reveals the history of an abscess formation weeks after upon the side of the joint opposite the original wound. This complication so often reported is removed by free drainage. The drainage tube must pass entirely through and across the joints. Physiological rest for many weeks must then be secured and no passive motion employed for at least six weeks; too early employed it has often excited inflammation, which has led to suppurative arthritis. Active motion must follow in turn, but not for sometime after the employment of passive motion and massage.

Excision may be a resource in fracture-dislocation when conservative measures are unsuccessful in restoration of function, attended by suppuration damage or necrosis.

Separation and damage of soft tissues.—Some soft tissues are endowed with more vitality than others; the upper extremity has better collateral circulation than the lower. Separated tissues, if not much damaged, are practically large grafts and should be utilized accordingly. I have retained a leg and covering where the skin and superficial fascia, open in front and attached at knee and ankle, permitted my hands, introduced beneath the integument from opposite sides, to meet at any part between these attachments. Tissue feebly nourished should be guarded from pressure. When great swelling renders pulse beyond injury unreliable, elicit synchronous beat in both companion extremities at same time. To prove it as the patient's, contrast count of patient and surgeon.

Ashurst defines primary amputation as that done before the development of traumatic fever. Intermediate amputation, that done during the existence of acute inflammatory symptoms. Secondary amputation, that done after the subsidence of fever and the occurrence of healthy suppuration. A more simple way of putting it might be, before wound infection, during infection, after infection. It can readily be seen that primary amputation carries with it less risk to life. Intermediate amputations are nearly always fatal, because a last resource, gangrene or erysipelas having supervened upon our effort to save a limb. While secondary amputation, resorted to because our effort to save a limb, though amputation has been useless, would have no greater risk than primary.

Part involved.—Generally speaking, amputations in the lower extremity are correspondingly more serious than amputations in the upper extremety, the danger increasing as amputation approaches the trunk.

Decided upon amputation the question confrouts us, where to amputate, how to amputate.

How to amputate? Our text books give bewildering though systematized replys, and picture to us ideal stumps from any and every operation. Search through the surgical history of the Rebellion will dispel the illusion. The hospital offers us the best field for study, but even here we see the stump only in its early formation. While intermediate and secondary ampu-

tations can usually be carried out on orthodox lines, primary amputation with which we have special concern seldom can. We have, therefore, numerous considerations before taking up an amputation in detail.

The flap or circular method in entirety or modified, satisfies all forms of amputation. Though necessary to have practical knowledge of the several useful special amputations, acute surgery, with our present disposition to sacrifice no useful portion will seldom call for or necessitate amputation upon specified lines. Good understanding upon these separate methods, however, contributes in this or that detail to our individual operation.

If our injury permits choice of amputation the question arises, what is to be our amputation. Conditions permitting,—that which, without increasing risk, carries with it facility and utility.

To be satisfied of our issue we must acquaint ourselves with the adaptation and mechanism of artificial limbs and be guided by their contrivers. In this country among many good manufacturers, I mention expressly Marks, of New York, and Fuller, of Rochester; either are capable, progressive and trustworthy. From their experience in adapting thousands of artificial legs I give important abstracts. The surgeon after familiarizing himself with artificial limbs should know their points of bearing in all amputations. An amputation through the shafts of the bone leaves the end of the stump insufficiently protected to bear pressure, consequently the weight is necessarily taken in part on the sides of the stump by compression and in part by the opposition of the artificial leg with the enlarging part of the stump. This means for amputation in the thigh, that the weight is taken on all sides of the stump above the end and about the ischium. For amputation in the lower leg, the weight is taken on the sides above the end, and on the surfaces of the tuberosities at the head of the tibia. In disarticulations in which the articular surfaces have suffered no interference, and cicatricial tissue is non-adherent, the entire weight can be carried on the end with comfort.

The stump is used as a lever, to operate the artificial leg,

and at every step there is a considerable pressure on the anterior surface in carrying the leg forward. The tissue covering the bone should be sufficiently free and yielding; the cicatrix if possible carried to the back; preference is next given the side. When tissues are adherent to the bone it is fortunate if cicatrix be protected by accommodating folds.

Marks regards disarticulation at the knee preferable to amputation at any point above, the condyles to remain intract. If the patella can be placed in the inter-condylic space and kept there without danger of slipping it is desirable. The flap should be anterior, that citatrix may be well up posterior; in any event cicatrix should be away from end.

He also states that Symes' operation at the ankle joint is bettered if the extremities of the bone are unmolested. This operation Marks also considers preferable to Pirogoff. I am myself convinced of its advantages. The bulbous extremity of all three stumps deplored by makers of limbs with ankle joints is not a formidable obstacle to the manufacturer of the of the limb with rubber foot which supplants the ankle, largely replacing it, and comfortably includes the stump. Until recently appliance of this character has been cumbersome; this is now overcome by Marks by utilizing aluminum. Both makers deplore Chopart's amputation in the foot but can adapt artificial appliance.

In forming flaps the rule holds good enough skin to cover the muscle, enough muscle to cover the bone. Except perhaps at the very end, it is desirable that the natural circumference of a limb be preserved; organization leaves us none too much.

Flap amputation, with nice adjustment, provides against seepage, clot, or hemorrhage; which at least occasion disturbance likely to interfere with primary repair, if not wound infection. It also adapts itself to injury and affords us a good bone covering. The circular operation, though simple, useful often, especially in the arm proper, has the drawbacks the flap operation provides against. It would appear to give all sides covering, but in the lower extremity when weight is placed on the stump, the whole muscular covering slides upward and allows protrusion of the bone.

In a double flap operation, if difference of length, the long flap should be the best nourished and afford the best cushion. In intermediate or secondary amputation in arm or thigh, the double antero-posterior method of operation is preferable. This is better done by transfixion the complete severance of the member in an uncomplicated case should not occupy more than three minutes, (I have seen double amputation in the thigh in forty-six seconds, at the hands of two operators with two corps of assistants), and no complications arising, the patient should again rest in his bed within the half hour.

If necessary to amputate in the phalanges, the double flap operation, short dorsal and long palmer flaps which bring the cicatrix post central is best; this maintains their tactile sense more perfectly. Aside from shoulder and hip, we may employ the single flap—perhaps Teale—where injury involves less tissue on one side than upon the other. Teal's method has, I think, application particularly to amputation in the forearm.

The oval method of amputating the fingers and thumb at the meta-carpo phalangeal articulation, and the toes at the corresponding articulation in the foot, is at once the simplest and best.

I present a case of amputation of the leg; by what might be termed a modified oval method. Incision was made entirely from without inward, working from above downward and backward. Retracting the muscles and entering the point of the knife in the middle line of the tibia anteriorly, it was pressed into the tissues and carried slightly downward and outward, now round the leg, cutting inward and backward, higher posteriorly, up on opposite side in same manner, and to point of departure. The incision was then deepened in the same direction and the tissues to the necessary extent dissected away from the bone and strongly retracted; the periosteum divided with a circular sweep for each bone at muscular attachment and bones divided in same line; the fibula half inch above the tibia, directing the saw in both from without downward and inward; in the fibula more decidedly so. The anterior margin of the tibia being excised by saw resection in addition. The incision completed we have a departure from a slightly convex oval only

anteriorly. Possibly this result, in this the common site of amputation, as nearly approaches the ideal as we are likely to get. The cicatrix is one smooth line, the covering relaxed, mobile, and ample, giving an ovoid end with a gradually increasing ascending diameter. The ends of the bones are imperceptible and not at once elicited by touch.

In dealing with injury of the upper extremity sacrifice nothing. Divide the phalanges as you would their coverings, removing only the necessary fraction. In the lower extremity, if you cannot save the inferior extremity of the bones of the leg, amputate in such manner as to divide the tibia and fibula at junction of their lower and middle thirds, at same time securing them abundant covering. From this point upward do not sacrifice the fraction of an inch.

The difficult matter is not to amputate, but to make your patient survive his amputation to full recovery. There are influences we cannot overcome, the direct result of the injury; others we can mitigate and relieve; there are others which foresight and care may obviate.

If amputation is to be delayed the wound must be made and kept aseptic. The operator should be supplied with a firm table, higher than ordinary, and good light. The ventilation should be proper and an abundance of hot water near at hand; also the necessary detail of antiseptic operation. Make provision against chill before, during, and after operation. Induce reaction before operating, resorting to auto-transfusion by bandage, or true transfusion if necessary for an ex-sanguinous patient. Having reaction, be ready to take advantage of it; you may lose it within an hour.

The patient should be spared the sight of instruments, and if possible the confusion of their arrangement. They should not be too many.

The anæsthetic should be selected and adapted to the case; its administration to begin when all is in readiness. After bone division and flap trimming it may be suspended, simply maintained for sleep and quiet, until introduction of sutures, when it may again be pushed for a few moments and then withdrawn. I prefer to use ether; but, if chloroform has been our agent the

introduction of sutures will not always necessitate its reapplication. I do not care to prolong chloroform anæthesia beyond twenty minutes. Reaction is quick from ether, slow from chloroform; these facts have bearing upon complications arising. Where chloroform is at first necessary it can usually be soon supplemented by ether.

The tourniquet should not be too tightly applied or may occasion vaso-motor paralysis; even gangrene with dilitation of the vessels. Ashurst's plan to limit circumstriction of the Esmarch tourniquet is to place in position a provisional Petit tourniquet over a circular muslin bandage, with pad formed from same bandage immediately over principal artery. The Petit remaining ready for use above the Esmarch, the Esmark may if desirable be released and removed before conclusion of operation, at time of ligating secondary vessels, and the Petit tightened to supplant it over a new though near site. The value of relief in holding for a long time a heavy weight by a narrow hold, like the wire handle of a heavy can is well understood. Where flaps are to be exposed to the air this has application; likewise in searching for a wounded artery or unseen sources of hemorrhage; here the Petit can be regulated loosened, and tightened with more facility than the Esmarch.

When advisable to apply the tournquet iprovisional before or after operation, the Petit answers best.

In primary amputation we may force blood from the extremity to be sacrificed into the general circulation and in so doing make some compensation for blood lost. To do so in intermediate or secondary amputation would force into the general circulation the products of disintegration. The position of the operator should be that most advantageous.

In primary amputation for injury all necessary adjacent living structures should be utilized ana cut, with a few exceptions, from without with scalpel, even dissected; bone irregularities should be removed; in fact we are only called upon to trim, group, and mold the parts into proper conformity.

A practice obtains in dealing with contused soft tissues of excising at once enough to insure perfect coaptation and primary union. This does not hold good in dealing with bad

injuries of an extremity, and particularly the lower extremity. In performing primary amputation here, if the parts are lost, mangled to pulp, or contused and separated from their source of nutrition—not simply separated—they should be removed; but if they still possess life they should be retained if useful. Area involved and blood supply having special consideration. Tissues should not be sacrificed simply to permit coaptation, particularly of the integument. Where a flap or part of a flap has been cut for us, say by car wheel, it is well at once to trim off its margin, so obviating marginal necrosis; if, however, its vitality is impaired beyond the margin, and ill defined, the flap in its entirety being a necessity, we are justified in removing that portion only which we know to be lost. The issue at worst will be a superficial or local necrosis or slough. The case properly managed, marginal losses have insignificant bearing. Multiple puncture to relieve stasis, often arrests or limits loss of this nature. When defined the mass should be separated by scissors and removed before softening; the now adherent fragments removed later by forceps, thereby reducing danger of absorption to the minimum. Their only ill effect is to delay complete union. If good judgment is exercised the design of our flap or flaps will be unaltered and we have assurance that every possible necessary fraction has been retained. A bone, apparently hopelessly denuded in its continuity, may in instances be kept healthy by covering of blood-cot. Occasionally I induce this; even a poultice answers the purpose, until the tissues which at first refuse to cover are better conformed, or it may be filled in by granulation and covered by graft. We have here a resource in plastic surgery slitting the resisting tissue to the necessary extent.

In intermediate or secondary amputation, but particularly intermediate, when the tissues are diseased, in operating the parts should be grasped firmly, the muscles retracted, and with them and to greater extent, the skin should be incised following by transfixion. Amputating in the shaft of the bone, the bone should be freed evenly of its attached muscles only to the line of section; these should then be strongly retracted. The periosteum should be accurately and evenly divided with

one or two sweeps of the knife in the line of bone division. Its separation and preservation is a fallacy and more often ends in its mutilation and bone exfoliation.

It is of the utmost importance that the saw and pliers be properly used. If this is not the case our stump is complicated by bone fissure or exfoliation, associated with more or less osteitis and altered stump. In our careless or unsophisticated effort to use a carpenter's saw upon a board in the majority of instances, we make both a poor beginning and ending. In the grasp of the operator the saw should be held firmly yet lightly, carefully started, brought to bear on the bone, (the lesser first, if two, as in leg), at an easy downward angle, moved by regular, quick, short, light strokes, cutting almost by its own weight, slowing up carefully when nearing division. All this time the limb enveloped in a towel for better hold, should be steadied by an assistant who bends it neither way, but giving support makes extension in the line of its long axis. If the teeth are set wide the saw will not bind. The site of division should be afterward carefully inspected and irregularities remedied. The flaps may now be trimmed, arteries ligated, nerves and tendons retrenched and cut off close that they may not be included in cicatrix. Arterial hemorrhage should be controled by lock hæsmostatic forceps; capillary hemorrhage by hot water assisted by pressure. Arteries of consequence should be ligated; for this purpose we may use silk, linen, or cat gut, according to our requirements; silk preferably, and not too wide, though strong; wide ligation has utility where structures are softened. In tieing isolate artery if possible; in any case do not include too much tissue. Do not tie too near end of vessel. Tie tight enough to divide internal and middle coats. Employ reef knot. Cut off one thread of ligature and knot the other for recognition as it protrudes from wound.

The sutures may be of silk, linen or cat gut, according to requirements. They may group muscles together; coapt deep surfaces as buried sutures, or be deeply introduced from the surface. They should maintain the wound walls and edges in apposition. Deep sutures may alternate with superficial sutures for coaptation. Sutures should be secured by reef knot

and tied on one side of wound, beginning at the center and alternating at the sides; not too tight, leaving relaxation sufficient to provide for inflammatory deposits. Those, including vessels in their continuity, should be especially relaxed. Where pendulous flaps a few strips of adhesive plaster may supplement suture. All hemorrhage arrested, the wound exposed to air until glazed and aglutinous, our ligatures should be grouped and brought out, protruding at the most favorable site for drainage, held to side by adhesive plaster if desired, a fenestrated rubber tube placed with them for twenty-four hours for like purpose, the walls brought together and maintained by fixing suture, the stump washed and dressed; a strip of protective covering the lip of the wound if desirable. Our patient should now be made comfortable in bed with his stump elevated.

THE SEMIOLOGY OF INSANITY.

By Eugene Grissom, LL. D., M. D. Denver.

There is a mysterious land unlike any upon which the sun shines. Its realms are as vast as the bounds of space, its thrones grander than the kingdoms of earth, its palaces more resplendent than the dreams of Aladdin; its rivers flow with eternal music, its forests wave in more than tropical glory, its oceans roll with the primeval grandeur that engulfed the ancient continents; its skies shine with auroras, whose light and color the sunlight may not hope to rival.

Alas, there is close by a region of darkness profound, abysses of frightful depth, sound and sights and fears of unimaginable woe; an unexplored home of spirit and demon and goblin dark, of spectres and all imaginable horrors. Here men walk all their days in leaden gloom, or sullen striving, or frantic rage against their fate. Beckoned on by a ghostly hand, they

enter this, the terrific plain of mania or melancholy, to march to a final grave within its caverns.

The former of these is the kingdom of *genius*, the latter is the habitation of *madness*. Between the two there lies a strip of unknown breadth, which we may term the border-land of reason. Here narrow, there wide-stretching and peopled by adventurous spirits who, sometimes crossing in rapid flight, have turned hither and thither with scorched wing and terror-stricken step; or, mayhap, in their devious way, now to hope and again to despair, have gone down at last in endless night.

In this border-land have dwelt great numbers of the marked men of their race; warriors, philosophers, kings, poets, prophets, artists, patriots and statesmen.

The history of our fellow-men who have thus partaken of the greatest glories, but also of the most frightful calamities that may befall humanity, has for us a fascination beyond the wanderings of a Livingstone or a Stanley in equatorial wilds, or a Kane or Greeley amid the frozen secrets of the arctic North.

Ever since man recorded his thoughts for brother man, the conception of the supernatural has accompanied his mental life. Consciously or unconsciously, we are striving again and again to pierce the veil about us, and know the ultimate reasons of things, and recognize their invisible causes.

From the time of the familiar Damon of Socrates, or the attendant spectre of Descartes, to the witches of our ancestors, and the spirit manifestations of our own times, the human mind has ever been reaching for alliance with the supernatural. To plunge into the depths of profound abstraction, to lose one's self in the inmost recesses of reverie, is a perilous journey, from which only the most gigantic minds, like Homer and Shakespeare, can safely return.

There are lessons from the shadowy side of life, of the wanderings of the great by Plutonian shores, that are often concealed from sight, or glossed over by the historic pen, or darkly hinted, but which, if openly read and courageously considered, may not be without good to come.

There is, perhaps, no disease or ailment to which human-

ty is subject, more obscure or less understood than insanity.

This proposition is intended to apply to its aetiology, classification, prognosis and treatment.

Even its definition is so difficult to formulate in words, that scarcely any two authors of original writings agree. This disease or rather the disease that produces it has in all ages been the *sui-generis* of pathology, baffling the investigation of science, resisting the efforts of philanthropy and defying the satisfactory administration of justice in criminal jurisprudence.

Not many ages in the past it was regarded as metaphysical and in its investigation and management was relegated, by common consent, to the domain of theology, being considered a special manifestation of Divine displeasure. The sufferers were subjected to punishment or rough treatment in order to exorcise the devils that had taken possession of the human body. In many cases whipping, ducking, starving and other cruelties were the recognized methods of treatment, sanctioned by law and practiced by their custodians. In the light of the civilization of the present age such a record of the administration of law and humanity, seems almost incredible.

The difficulty of a thorough knowledge of the pathology of mental disease is to be found in our superficial knowledge of the physiology of mind in health. Without thoroughly understanding a healthy mind we can hardly be expected to comprehend all the mysteries of a diseased one.

The first inquiry that engages the attention of the alienist and the student of psycology is, What is mind?

Teachers and writers would not all formulate the answer to this question alike. There can be but little hesitation in answering that. Mind is the sum of the mental faculties of the brain and nervous systems. These faculties are divided by all the writers of mental philosophy, as well as the intelligent alienists and psycologists, into the intellectual, emotional and volitional functions. The intellectual faculties preside over thought; the emotional over feeling and the volitional over action. This last may be called the executive power of the mind. While the localization of many of the physical and

some of the mental functions of the brain has been determined, others are still unsettled or unknown.

Some of our ablest investigators, while admitting that the purely intellectual functions are the result of cerebration, also think that the emotional faculties are based on the great sympathetic nervous system.

The intellectual faculties, whose physical basis is the brain, are almost universally believed to be:

Perception,
Conception,
Memory,
Reason,
Comparison,
Understanding,
Judgment,
Imagination.

It can scarcely be allowable, in a short paper like this, to occupy your time and attention with anything more than a bare statement of a proposition so universally conceded, to-wit: That the brain is the organ of all the purely intellectual faculties, and that the classification just recited is sustained by all distinguished authors; some of whom state that investigation has proven the location of this class of functions to be in the gray matter of the anterior lobes of both hemispheres.

The classification of the mental functions into intellectual, emotional, and volitional, was first taught with emphasis by Griesenger, perhaps the most thorough alienist, in both theory and practice, that any country has ever produced. His work on "Mental Diseases" is to all others, in many respects, what the Bible is to Commentators.

The sub-classification on the intellectual faculties of the brain needs no discussion, if the consensus of opinion of the highest authority of specialists, as well as the observation of the profession generally, is accepted as conclusive.

That the emotional, or second division, is altogether distinct from the intellectual, either in physiological or pathological investigation, is by no means so universally acknowledged.

Indeed it seems unaccountable, that by some reputed experts, it is not acknowledged at all.

By Griesenger, Maudsley, Hammond, Bucke, Ranney and numerous others, the distinction is as clearly and conclusively defined as any other proposition in mental science. By some it has been discussed under the misnomer of the moral faculties. Dr. Hammond has discussed this subject with more ability than any recent author. Most authors divide this classification into the:

Emotions,
Affections:
Desires.

The differences exhibited in the semiology of this group of mental functions from others, both in health and disease, are so apparent as to suggest the idea of different physical bases altogether. This view, however, has not been formulated, so far as I know by any standard author on mental disease. It must therefore depend for recognition, more upon reason and observation than upon authority.

There are, I believe, many arguments in favor of the opinion that the great sympathetic nervous system and not the cerebro-spinal, is the physical organ from which these functions emanate. The functions as a whole of the great sympathetic nervous system have never been very clearly defined. Those of the cerebro-spinal have.

In health the intellect *thinks* and *knows*; the emotional nature *feels* and *desires;* the volitional *wills, acts* and *executes;* The organ of the first is universally admitted to be the brain; of the second is most probably the great sympathetic nervous system, of the third, a part and parcel of both the cerebro-spinal and the great sympathetic; this three-fold division of the mind is not composed of independent entities, but are in construction and function "distinct as the billows, but one as the sea!"

The sub-classification first mentioned is the recognized embodiment of the intellect. The emotional group is clearly represented by the functions and feelings of:

Love,
Hate,
Faith,
Fear.

Three of these terms, to-wit: *love*, *hate* and *fear*, require no explanation. *Faith* needs to be defined. *Faith* is the opposite of fear as love is the opposite of hate. It is purely moral function. It should not be confounded with belief, which is purely intellectual function. Faith is almost synonymous with *trust*, *confidence* and *courage*.

To determine the functions of the great sympathetic with as much accuracy as we understand the functions of the cerebro-spinal, let us examine briefly the structure of this vast complicated organ. The great sympathetic consists in the first place, of a double chain of ganglia, over fifty in number, extending from the base of the brain, along the sides of the spinal column to the coccyx; of cardiac ganglia, the semilunar; and numerous others, named and un-named, scattered among thoracic, abdominal and pelvic viscera, together with nerve cords connecting the sympathetic ganglia with nerve trunks and nerve centres of the cerebro-spinal system. No part of the body is entirely without sympathetic fibres and in the aggregate this system cannot fall below the mass of the cerebro-spinal system. One author, (Davy), says that "it constitutes a great part of the volume and whole weight of the body;" and a recent writer in physiology, (Bucke), says that, "neither its cells nor its fibres are like those belonging to the brain and cord; that the difference in minute anatomy between those two systems is sufficient to make it quite certain that there is a decided difference in their functions." High authority teaches that of the organs supplied by this system the *heart* receives the greater quantity. Next to the heart come the *suprarenal capsules*; in the third rank stand the *sexual organs*, the *testes* and *ovaries*; next in supply are the organs of special sense; next the stomach, the intestinal tract, the liver, the kidneys, the spleen and pancreas, and lastly the lungs, which in proportion to their size receive a very small supply.

An important conclusion, from these and other anatomical

and physological facts, is that the movements of the striped muscle are controlled by the cerebro-spinal,and of the unstriped by the great sympathetic system. Dr. Bucke says that this system exercises controlling influence over the secerting glands and that the will on health has no influence upon the functions of these glands. If this be true, as it doubtless is, it has an important bearing upon the ætiology and diagnosis of emotional insanity, and is suggestive of the want of moral responsibility for actions of violence on the part of the victims of this form of mental aberation.

Several of the vital organs receive no nerves from the cerebro-spinal, but are exclusively supplied by the great sympathetic. Of these may be mentioned the kidneys, the ovaries, the suprarenal capsules and the liver. And as we all know these organs when diseased, not infrequently produce the profoundest symptoms of emotional insanity. Can this argument be answered upon a different hypothesis?

Want of time prevents the discussion of the question of the locality or basis of emotional functions to a conclusion, but I suggest as a fact in the experience of the entire profession, that in the diseases of organs which are comparatively scantily supplied by the sympathetic, such as the bones, muscles or lungs, there is little or no derangement of the moral or emotional nature; on the other hand, in diseases of the stomach, heart, liver, kidneys, suprarenal glands and of the testes, ovaries and uterus, there is always some, and often great disturbance of the emotions. In cancer or ulceration of the stomach, and chronic gastritis, there is a great degree of emotional disturbance. All physicians engaged in general practice have seen cases of dyspepsia in which melancholy or occasional attacks of depression or terror rendered the patient's condition pitiable in the extreme. I have witnessed such cases often in diseases of those organs supplied almost exclusively by nerves from the sympathetic system and in cases where the mind was perfectly clear and no preceptible disturbance of any part of the cerebro-spinal system. The lungs receive a very small supply of sympathetic nerves, and we know that very long continued disease of their tissue, ending in destruction of consid-

erable portions, and at last in death, will often scarcely give rise to low spirits, never to extreme depression or to violent emotion of any kind. The heart receives a very large supply of sympathetic nerves and its diseases, such as fatty degeneration of its substance, and calcareous degeneration of its arteries, are accompanied by very great depression of spirits, and often by agonies of anxiety and terror.

But the strongest illustration of my argument is Addison's disease of the suprarenal glands. The number and size of sympathetic nerves sent to these bodies, is very great. They receive no cerebro-spinal nerves at all. Those who have cases of this disease are cognizant of the extraordinary effect produced upon the emotional or moral nature of the patient. Long before the sufferer is obliged by the degree of his illness to abandon his usual occupations, extreme low spirits, bordering upon despair, seize him. Lastly it is within the experience of every one that a cry of distress heard suddenly, awakens a corresponding emotion in the hearer before any thought is aroused.

To summarize the argument, everybody concedes that the cerebro-spinal nervous system, the brain more especially, is the organ of the intellectual faculties of the mind. Whether I have proven it or not, there can be no doubt that the great sympathetic nervous system is the organ of the emotional faculties. The basis of the volition or will, has its location in both systems and will be explained more minutely in the pathology of structure.

The question now recurs: "What is Insanity?"

Philosophically it is the penalty of the progress of modern civilization.

Science has overturned the theories of centuries on this subject! It is now universally admitted to be a diseased condition of the physical basis of mind in health. Its definition is so difficult to formulate that scarce any two authors agree. Griesenger defines it to be: "A complication of symptoms of various morbid conditions of the brain."

Maudsley says; "It is a disorder of brain producing disorder of mind, or rather a disease of the supreme nerve cen-

tres of the brain, the special organs of mind, producing derangement of thought, feeling and action, together or separately, of such degree or kind as to incapacitate the individual for the relations of life." This definition of Maudsley has met with great favor among physicians.

In all the definitions, while necessarily more or lessinaccurate, on account of the difficulty of including in a few words, all the phenomena of a disease so intricate and obscure, and excluding all the symptoms incident to the various other brain or nervous troubles, either as a *post hoc* or *propter hoc* in pathology, is the important fact that a diseased condition, either functional or organic, of the physical basis is essential to the unhealthy functions which we designate by the term insanity

In answer to a request by a circular letter addressed to the members of the Medico-Legal Society of New York, for an original definition of insanity, I gave the following answer: "Insanity is a perceptible departure from normal mental life, resulting from functional or organic disease of the brain or nervous system, without adequate, recognizable causes for said departure." This definition is intended to exclude many symptoms of diseases resembling technical insanity; such as the delirium of fever; aberrations resulting from narcotics or stimulants to excess; traumatic injuries; inhalation of anæsthetics, etc.

Great advancement has been made in the ætiology, pathology, diagnosis and treatment of the various forms of mental disease from the constant care and treatment of patients and especially by *post mortem* microscopical investigations of the brain of those dying of this disease, as well as those who were restored to health, whose history was noted and compared to the microscopical development of brain tissue.

Every hospital for the insane should be equipped for these investigations for the benefit of science and humanity. Microscopy affords the wide field for investigation in the *terra-incognita* of this specialty in medical pathology, And every medical college should have a regular chair and professor of psycological medicine as a part and parcel of its curriculum. In this connection I beg leave to report a few sentences I ad-

dressed to the Alumni Society of the medical department of the University of Pennsylvania at its annual reunion in 1885:

"What interest has the general practitioner in adding a knowledge of insanity to his medical information?

Why should psychological medicine be taught as thoroughly as any other portion of medical science?"

In reply, it may be asked, why should that form of nervous disorder, which is at first the most curable perhaps, but which misunderstood and neglected becomes the most fearful of human afflictions rendering life an unending torture, blasting the happiness of home, poisoning the fountain of life for an innocent posterity and perhaps closing in the destruction of life and posterity to find its rest in the grave of suicide, why, let us ask, should this disorder which is the crown and culmination of so many nervous afflictions, alone be set apart to the study of a few physicians, when the whole medical world might share the task? The law very properly requires that the insane, before any abridgment of their liberty by confinement in a hospital, shall be duly adjudged as victims of their disorder, after the examination of physicians. Why not prepare the medical man for that delicate and difficult task? Remember the decisive moment is often passed, alas, perhaps usually lost while friends are ignorant, and the young physician is slowly apprehending the force of facts, which in the light of clinical experience, would force conviction, quick and irrisistible upon him. Too true it is that here he who hesitates is lost.

Or is it to be maintained that physicians ought only to be expected to pronounce upon the existence of insanity after the early prodromic stage of such vast importance has already passed away and the disease is triumphantly marching on to its predestined wreck of the faintest of human hopes?

Maudsley well says:

"Mental disorders are neither more nor less than nervous disorders in which the mental symptoms predominate; and their entire separation from other nervous diseases has been a sad hindrance to progress."

It is indeed that to your profession the insane owe all the

successful efforts to relieve their wretched condition and in their hands only has moral treatment been effective to the relief of thousands from an agony as far transcending the throes of physical pain, as it is possible for the immortal part of man to excel in capacities of joy or woe, the poor beast that gambols at his feet.

Let the medical profession at large make universal preparation to solve the problem of the care of the insane, and soon alike with popular cruelty, with the dark popular dread of the victim, and the unfathomable mystery which divides the affection from other and kindred neuroses, vanish from the excited imagination of the public mind.

To repeat in brief the reasons for the teaching of psychological medicine, with fullness and with all the aids of science and experience, it is

Because it is properly a department of medicine.

Because it is the chief of nervous diseases, many of which culminate in insanity.

Because it has to be met by the general practitioner, whether with preparatory study or without it.

Because when so many cases may be absolutely cured, if observed promptly and treated in the formative stage. Because physicians in the army or navy are necessarily called to treat such patients, perhaps throughout the whole of the decisive period. Because of its vast importance in a medico-legal sense, as affecting the distribution of property and the administration of the criminal law. Because lives and character and property of great value may be spared from destruction by its early recognition. Because a free interchange of experience between physicians in charge of the insane, without and within the hospitals for their care, would greatly contribute to the enlightenment of the people, and the removal of the remaining relics of superstitious dread which disgrace so many communities. But chiefly because the entire medical mind of the country would be engaged in solving the great problems of the mental hygiene of the people, problems which must be satisfactorily met, if civilization is to endure the strain of its own internal forces And this brings us to consider the question as

to the need of greater efforts for the care and treatment of insanity, especally in America.

The steady increase of insanity within our borders is a demonstrable fact. For a time it was explained away by the imperfections of the census, the better recognition of its subjects, and the greater attention devoted to their discovery and care. But we can deceive ourselves no longer. Year by year and day by day, this tide of human misery is rising.

The simplest *a priori* reasoning would lead us to this conclusion. We live in an age of excitement. Our whole environment bristles with stimuli, from the cradle to the death bed. The school systems with the tramp, tramp, tramp of juvenile grade in the march to overtake one another, with the sad but inevitable application of "the survival of the fittest," the feverish eagerness for the cares and prizes of life, before the young shoulders are fitted for the toga; the impatience of parental control in childhood, and half concealed defiance of all laws, statutory and social, that clash with the independent thinking which our whole body politic encourages; the enormous fortunes and enervating luxury of the few, and the grinding privations and harassing anxieties of the many; the Moloch of business to which as a people we sacrifice health and comfort; the ceaseless activities of mankind which we struggle to know by the cable and the lightning press, and now even by the very voice of the world, breaking by the telephone upon the hours once set apart in our retreats for rest; the distributions of physical stimulants and their adulterations in food and drink; the unsanitary condition of the great centers of population, breathing poisoned air, whether in scenes of revelry or in the sanctuary of devotion. and last but not least the vast influx of immigration of the cast off, criminal, pauper and diseased population of the old world. All these elements acting and reacting, and their effects pathologically reproduced and aggravated in the children of so many imprudent marriages between the heritors of misfortune, render it impossible to expect less than the widespread mental disorder which is one of the gravest dangers that confronts modern society.

Bnt we are not left to mere possibilities. I am indebted

to the startling figures that reveal such facts as these, collated from the census reports of 1880. Those of 1890 generally increase the figures. The total number of the insane, by the census of 1880, was 91,997. In the northern states the proportion of insane was 1 to 597 of native white population; in the southern states 1 to 660. Among the colored races in the northern states 1 to 545; in the southern states 1 to 1,232. The average of the whole native white population of the United States was 1 to 618. Among foreign whites 1 to 250. Among the colored races 1 to 1,097. And the general average of the whole population was 1 to 545.

Two points have thrown light upon the situation. Note the vast difference between the negro of the states of the north collected chiefly in cities, and the object in full force of the enervating and disorganizing influence of modern habits upon his bodily frame, and the same negro in the south for the most part as an agricultural laborer, with few wants, a limited round of excitements, and dwelling in the free air of heaven as his fathers did. Nor does this arise from a neglect to enroll the colored insane. The state which I have the honor to claim as my (former) home was the first to build and equip with all the appliances of modern science a hospital for the colored insane. The free gift of the white race for the comfort and restoration of their colored fellow citizens.

The second point of importance in these statistics is the surprising announcement that one of every 250 of our foreign born whites is insane, a ratio more than double the general average. What a tale this tells of the debris of social life in Europe poured upon our shores to poison the life currents of this country. But this is not the place to discuss the economic questions of the sanitary control of immigration. I desire but to recognize among us the presence of a mighty evil.

Already more than a decade has passed since 1880, and we can scarcely doubt from past experience that the number now approximates 150,000. What an army of unfortunates. Of these there are probably 50,000 under treatment and thousands of the others are either propagating successors to their heritage of wretchedness, or carrying with them the faithful companions

of the household, worn out with pain and anxiety, with watchings and privations, until patient and nurse alike sink into the maelstrom that so rarely gives up its dead. Who is there whose life has been spent among the sombre shades of the hospital for the insane, who has not witnessed this piteous spectacle again and again?

One hundred thousand lunatics to be cared for. They are already here present with us. No reasoning can do away with their presence, standing a mighty bar to national prosperity, a terrible menace for the future. Their support and comfort and hopes of restoration depend upon the toiling numbers, who remain after subtracting all their children, the disabled by sickness and infirmity of every kind and all the idlers.

Tell me that it is not a solemn duty laid upon the medical profession, to hasten to the relief of the patient citizen, who must bear this burden of accumulated woe. What has been done heretofore at home and abroad to foster psychological medicine?

The immortal Rush himself was accustomed to teach the didactics of insanity, according to what the pathology and therapeutics of his time might afford, and he took his students into the wards of the insane; from 1791 even, until, long after, such duties fell within his province. If the next half century should be as rich in advancement as the last, the debt of gratitude to science will be too large soon to be paid.

The pathological condition of the brain and nerve centres which produces insanity as their penalty, are already known to be in part, (1) dilatated and torturous state of many of the blood vessels of a greater or less part of the cortex; sometimes diffused redness of portions of the brain matter; deformations of various kinds in the nerve cells:

2. Many vessels engorged with red corpusles.
3. Sometimes slight extravasations.
4. Fatty granulations and pigmentary deposits.
5. Hyperæmia of the optic thalami.
6. Serous effusions into the meninges.
7. Thickness and congestion of arachnoid and piamater.

These observations, by no means exhaust the pathological

conditions of those complex organs that produce mental aberration.

Dr. Hammond, after enumerating the organic changes to be observed in the several classes of mania, melancholia and the intellectual and emotional groups, such as emotional morbid impulses etc., says: "That the volitional insanities are likewise due to changes in the blood supply in the lower layers of the cortical cells, which he calls aboulomania, or as we should say paralysis or inhibition of will powers and that vaso-motor spasm produces an anæmic condition of brain cells and nerve centres which paralyses the executive functions of the mind." But I cannot dwell here. I will, however, offer a few important symptoms appertaining often to any or all the classes or groups recognized in this paper.

I have condensed the phraseology as much as I could to express the orthodox opinion of the best authors. I define the three most characteristic modifications of mania, melancholia monomania and circular insanity as follows:

A delusion is a false judgment, idea or belief resulting from physical disease of the brain or nervous system.

Bucknell gives as an example of this form: "Thinks his head is made of brass or that he is a beggar or a prince." I had a patient with the fixed delusion that she was the wife of the prince of Wales.

Hallucination is a false perception of the senses: "Thinks he sees in the dark, hears through thick walls, etc."

An illusion is a mistaken perception of the senses:

"Thinks a cloud is a chariot, a foot step is the march of an army."

In hallucination there is nothing to see; in illusion there is something to be seen or heard.

Wherever a delusion, hallucination orillusion can be dispelled by reason on the part of the patient it is not a symptom of insanity.

The classification of insanity is a task about which there is a wide difference of opinion. The systems of classification are almost as numerous as the writers on mental alienation. The different methods employed may be mentioned as:

1. The anatomical.
2. The physiological.
3. The etiological.
4. The psychological.
5. The pathological.

The psychological method was followed by Griesenger and other distinguished compeers and successors. Pathology by this method retains the same group as physiology, to-wit: Intellectual, emotional and volitional insanities. These are sub-divided into:

1. Mania, an exalted condition of mental derangement generally characterized, in the acute stage, by delusions, hallucinations and illusions.

2. Melancholia, a condition characterized by depression, without delusions or delirium.

3. Monomania, a preversion of the intellect characterized by exaltation or depression, limited to a single subject, or a small class of subjects.

4. Circular insanity, a variety of mental alienation characterized by alternations of exaltation, lucid intervals and depression.

5. Dementia, characterized by weakness or loss of the mental powers.

I have devoted some time to the consideration of definitions which might convey with considerable clearness the meaning of such important characteristics of certain forms of disease as delusions, hallucinations, illusions, etc., but regret that the limited time does not admit of too much prolixity.

Some of the views expressed in this paper on inquiries, not altogether settled, coincide with those similarly expressed by Dr. Hammond, now of Washington, D. C., whose learning and labors entitle his opinions to great consideration.

DISCUSSION.

Dr. Yoakum.—I think the doctor is correct in regard to the progress of insanity in civilization. I have realized in my short life, that the graduation of children from school at the

ages of 16 and 17 years is very detrimental. The German definition of insanity is "a sick mind," and I think that covers it exactly. I believe the great emotional part of our being runs right along with the intellectual and volitional, and emotional insanity predominates over all other forms of insanity; and as we stuff and cram into our sculls, so will these faculties become impaired. A lady came into my office the other day and said that her greatest wish was, that her child should graduate by the time she was 16 years of age. One of our best ladies. Think about it! Graduating with high honors at 16 years of age.

One of our best physicians said it was impossible for the best mind to hold the acme of thought over fifteen minutes, and yet they cram that child of 16 with all the honors of a scholar. I want to endorse that paper particularly from the standpoint that insanity is increasing in the direct ratio as our civilization and educational facilities progress. I hope the physicians here will think more about that, and use their best judgment and their best teachings in putting down the cramming process. The idea of putting a child in some of the schools at 4 years of age, keeping them constantly strained, and expecting them to graduate at 16 with high honors.

I had the honor to address a teachers' association of one of our southern states, and when I attacked the question, that it was impossible for a mind to hold its thought for fifteen minutes, some of them said "that they could bring up children 15 years of age that had graduated"; and that is what is filling our insane asylums today.

I would say that allienists are not all agreed as to the location of the centers for the emotions, but it seems that the predominating opinion places them in the great sympathetic nervous system.

VASO-MOTOR DISTURBANCE.

REPORT OF A CASE.

By E. R. Axtell, M. D., Denver.

Vaso-motor disturbance as a distinct disease has no right to any claim of place. It is but a symptom, a symptom of importance and with our present limited knowledge, a symptom demanding separate discussion.

By a vaso-motor disturbance we mean a disturbance of circulation due to perversion of the normal nervous influence over the blood canals.

The following case of intermittent general vaso-motor disturbance, with some permanent conditions, may help us to understand the known physiology of vaso-motor control.

J. C. A., aged 28, a machinist, married, was born in Illinois. In Colorado ten months. Family history good. Patient has always enjoyed good health. When a child had mumps and measles. When seven years of age he had malaria for a period of six months. When he was eight years of age he fell down a cellar-way and struck on his head. Does not know whether he was rendered unconscious. From that time for several years his head felt feverish to him every night and it was a habit of his to put his head against the cool wall of his bed-room.

From fifteen to twenty-three years of age patient suffered with dizzy, blind headaches. He had the attacks as often as from two or three times a month to two or three times a year. The attacks would start with frontal pain and nausea and then he would have dizziness and a peculiar blindness in which objects would be blurred and apparently jumping. The attacks would last about two hours and then gradually go away; but the patient would feel depressed for several days afterwards.

Twelve years ago patient had a mild typhoid fever. Was sick in bed two or three weeks.

Patient has been a great smoker since his ninth year. He also used chewing tobacco. Until recently he was accustomed to smoke from five to eleven cigars a day.

He denies alcoholism and syphilis. He has been married three years and has three children. His second child, a girl two years of age, suffers with a papilloma of the larnyx for which tracheotomy has had to be made.

The present trouble began in the fall of 1890. He noticed that on getting into a heated room, peculiar sensations were felt all over the body and head, described by the patient as needles pricking the skin, which needles seemed to get hotter and hotter until in from three to ten minutes he began to perspire, when the paraesthesea began to disappear. He says he does not perspire much, or at all readily at any time. Before this trouble commenced he perspired just as much as anyone would and much more easily and freely than he does now.

With this trouble or possibly antedating it a short time, he noticed that he was gradually drinking more water and that he was annoyed by an increased desire to make water. From this time that symptom has continued constantly, being always worse in cold weather.

Since the onset, patient has experienced the peculiar sensations in the skin only in winter, and that only on getting heated. The sensation seemed to start in the back and almost instantly seemed to go over the entire body. When it was at its height patient could not endure it. He would have to quit his work and go into a cool place.

The first winter the trouble was not so great, for the patient could overcome it by keeping on at his work, until he began to perspire, when the trouble ceased. The next winter the trouble did not bother him very much. He was able to work, and only a few times during the winter did he experience any trouble and then only slightly.

This past winter the sensation started in early and markedly. He was keeping a grocery store early in the autumn but because of his skin sensation and because of his desire to urinate so frequently, he gave up his work and for three months he has not been able to do anything. During cold weather he has to urinate from twenty to thirty times within twenty-four hours. Patient states that he makes a good quantity of water each time and that he can never hold it long without discom-

fort. Once or twice it has come involuntarily. Does not have to get up in the night to make water.

Though patient has avoided heated places during this winter, still he has had the peculiar sensations in the skin, fully a thousand times during the season.

During the winter patient has taken ten or fifteen Turkish baths. In taking the first bath it was fully fifteen minutes before he began to perspire freely. During this time he suffered intensely and moaned with pain. Since then he has had some trouble, but much less than with the first bath. He states that frequently during the winter he has had to get out of bed because of this peculiar sensation. As soon as he gets cold he can again retire.

With this array of symptoms, patient has a decline of mental vigor, feels languid and is melancholic most of the time.

On careful consideration of the case I found that he slept well, that he had no cough, that the appetite was fair. His bowels moved two or three times a day, the stools being of the usual consistency. Patient states that he drinks a great deal but is always thirsty. He has a dry, burning sensation under the sternum almost constantly. Physically, patient thinks himself in good condition. Present weight 150 pounds. Since the onset of his present trouble his sexual vigor has been less than formerly. For several years, and antedating the present trouble, patient has had indigestion. He complains of a dull, sore, tender feeling in the epigastrium, which is sometimes increased by the taking of food. At times he has a dull, uneasy feeling in the right testicle and in the small of the back over the left kidney. At this place he has some constant tenderness. During the past year patient has had seven or eight boils on the back of his neck, some of which did not open but simply dried up.

The physical examination revealed the following rather negative condition: Pulse 90, temperature 98, tongue dry and coated with yellowish fur. Examination of lungs and heart show nothing abnormal. No stone in bladder on sounding.

Amount of urine excreted, April 27, 28 and 29, one gallon per day. Examination of urine, February 18, 1893. Urine of

a light amber color, faint odor, specific gravity 1016, pronounced acid reaction, no albumen to heat or nitric acid, no sugar to Trommer's or Fehling's test.

The examination being continued revealed that both pupils respond to light and accommodation. Fields normal for white except slightly contracted above. Eyes carried in all directions normally. Taste and smell normal. Hearing normal.

The examination of the eyes by Dr. John M. Foster, revealed: "Remote vision 5–5 in both eyes. Slight amount of hyperopia in right eye. No heterophoria. Amplitude of accommodation good. Ophthalmoscope shows a horizontal elongation of the left optic disc, which is not abnormal. Otherwise both fundi normal."

Patient presents no ataxia in arm, leg or chest muscles. Muscular power of legs and arms perfect. Dynamometer, R. 130, L. 125. Patellæ reflex normal; no ankle clonus. Cremasteric, abdominal and epigastric reflexes present, but slow. Only strong stimulation will bring them out. Plantar reflexes normal. Deep reflexes of arms normal. Tactile, localization, pain, muscular and posture senses perfect throughout body. On the outer surface of both legs and feet, patient recognizes cold at once, but heat of considerable degree is poorly recognized and sometimes called "cool."

Examination of urine, March 25, 1893. Amount passed 12½ ounces. Patient had passed urine of nearly the same amount thirty-five minutes before. Urine very pale, specific gravity 1,000, faintly acid; no albumen, no sugar.

In this patient we have then an array of symptoms due to disturbed vaso-motor control. The feverish head of the patient when a boy, after his head injury, is the first evidence of his trouble. The peculiar paræsthesia and the increased urinary discharge are the later evidences. To fully understand the case under consideration it is necessary for us to review in a concise manner the known physiology of the vaso-motor system. We know that the nervous system controls the heart's action and regulates its force and frequency of beat; and we know that each artery and arteriole has its calibre increased and diminished by the nervous system. It is upon the muscular wall of

the arteries and arterioles that the nervous system exercises its influence. This muscular coat in the smallest arteries is proportionately larger than it is in the larger arteries, and it is over these vessels that the nervous system especially exerts its control.

If we remove the blood vessels of a rabbit's ear from the influence of the central nervous system, by dividing its sympathetic nerve, the blood vessels in the part dilate and remain so. Now if the peripheral end of the divided nerve be stimulated the dilated arteries return to their natural size, or become more contracted than normal.

The usual condition of an artery, a point midway between extreme dilatation and extreme contraction, is termed the normal tone of an artery. This normal tone is maintained by the nervous system and every artery has a nerve, which maintains in that artery the normal tone. These nerves are called vasomotor nerves, and we find them running from the spinal cord and sympathetic ganglia, now in the cerebro-spinal nerves and now in the sympathetic. There are evidently two sets of fibers in these nerves, one set of fibers producing when stimulated, dilatation of arterioles, another set when stimulated producing contraction. These fibers are now called respectively vasodilators and vaso-constrictors. The center of these fibers is now ascertained to be in the gray matter in the interior of the medulla oblongata. On each side of the median line, in or just beneath the floor of the fourth ventricle, we find the center. It extends from the calamus scriptorious to the level of the sixth nerve nucleus. Each division governs the vascular tone of its own side of the body, and lesions in its region may produce unilateral vaso-motor symptoms. From this center the vasomotor fibers pass down the interior of the spinal cord and issue from it along with the anterior roots of the spinal nerves. They then traverse the various prae-vertebral ganglia of the sympathetic system and accompanied by branches from these ganglia, pass to their destination. The center in the medulla can be excited to reflex action by strong irritation locally applied, as by improper blood passing through the medulla. When the

center is excited to reflex action a general constriction or dilatation of the vessels of the entire body ensues.

From various experiments it seems probable that the general center in the medulla is made up of a number of individual or special centers, each of which govern the circulation of a definite part or organ. The vascular tone of the thoracic and abdominal viscera is especially thought to be regulated by a series of such centers. Tiny destructive lesions in portions of the medullary vaso-motor center, have caused hemorrhages to occur in the lungs, pleuræ, stomach, intestines and kidneys. Then the well-known experiment of puncturing the medulla, producing glycosuria or polyuria by causing local hyperaemias of the liver or kidneys, confirms this view.

The vaso-motor center in the medulla is not the only center in the body, for secondary or subordinate centers exist in the spinal cord and in the various regions of the body and on the blood vessels themselves. Through these subordinate centers under ordinary circumstances, vaso-motor changes take place. The higher vaso-motor center is chiefly called into play by afferent sensory stimulus. According to the stimulus it acts in two different ways, either to increase or to diminish in part the normal arteriole tone. If we have an increased arteriole tone, the blood vessels become smaller and angiospasm is said to exist. Now the affected part having less blood, becomes pale, and irritation no longer causes a vaso-motor reflex. If the skin is the seat of the spasm, it looks shrunken and anæmic. It feels cold and has the appearance of *cutis anserina.* It tingles and there is present anæsthesia and analgesia.

A temporary or permanent paralysis of the vessels is known as angio-paralysis, and it is much more frequent than angiospasm. It depends upon paralysis of the vaso constrictor nerves, or upon excitement of the vaso-dilators. Now the skin shows bright red or mottled. It is warm and there is soon an increase of sweat. With the hyperæmia there is an increased sensitiveness to changes of temperature, a subjective sensation of heat, and hyperæsthesia and hyperalgesia occur.

Not only do sensory stimuli reflexly excite the medullary vaso-motor center, but impulses from the cerebrum may also

affect it. This is seen in the angio-paralysis from emotional disturbance.

With the vaso-motor center in the medulla there is supposed to exist a vaso-dilator center. Its existence has not been definitely proven, but it is strongly surmised. Its action is opposite to that of the vaso-constrictor center and obviously it gives origin to nerves which cause dilatation of arterioles. The existence of vaso-dilator nerves is assumed from such experiments as dividing the chorda tympani nerve. From this there is no change in the blood vessels of the submaxillary gland, but if the peripheral end of the nerve be stimulated there is dilatation of the blood vessels of the gland, so that the veins discharge bright florid blood and on section spout blood like an artery. The same array of phenomena occurs in a similar manner in many parts of the body, especially marked in erectile tissue.

Applying this knowledge to the case reported let us see what relation each symptom bears to the known phenomena of vasomotor disturbance.

Seeking for a cause in the case, I find but two available ones; one, the fall on the head when the patient was a child; the other, persistant smoking and chewing.

He states that he received his fall on the head when he was eight years of age and for many years afterwards suffered with feverish head at night. But as he began smoking at nine years of age, the smoking might have been the main factor after all.

Concerning the influence of tobacco or nicotin on the vasomotor system I may cite Ostroumoff who says nicotin is a powerful excitant of the vaso-dilator nerves. When we remember that as a growing lad he smoked a great deal, the cause for his early trouble is apparently revealed. The injury to the head might have modified the functional activity of the ganglionic cells, just as occurs in spinal concussion, or it might have produced a minute hemorrhage, laceration or a local softening.

In the patient we have from our examination a permanent dilated condition of the renal blood-vessels, either of one or both kidneys, which dilatation allows the transudation of a

large amount of pale urine. There is no inflammation of the kidneys, because no albumen nor casts have ever been found in the urine. This permanent dilatation is of only about four years standing. It is probable that the use of tobacco is the cause of it all. No doubt he had had repeated attacks of polyuria, which escaped his observation. At times the urine is slightly lessened in amount; apparently nature making an effort to constrict the kidney vessels.

The persistant dilatation of the vessels depends upon two things, either stimulation of the vaso-motor dilators to the kidneys or lessened inhibition over their vaso-motor constrictors.

The stimulation of the vaso-motor nerves might occur from a small tumor, a small blood clot or some definite lesion involving that portion of the medulla controlling the kidney circulation. Such a lesion would affect the circulation of but one kidney and that may be so in the case studied. The pain and soreness over the left kidney could be thus explained. Then any irritation of the vaso-dilators along their course would produce their permanent dilatation. Such irritation might come from adhesions, small tumors or localized inflamations, but as these nerves run with other nerves and as we have no symptoms of other nerve involvement we can dismiss it.

A lessened inhibition over the vaso-constrictor nerves to the kidneys, could be accounted for by lessened central functional control or by a diminution in the transmission of this control to the kidneys. Of the latter we have nothing to indicate, as the spinal cord bearing these nerves is normal.

With the permanent dilatation of the renal vessels, my patient has vaso-motor nerve storms. During cold weather, when his cutaneous capillary system is contracted, a slight stimulus of heat causes a reflex disturbance in the central vaso-motor center and at once the vaso-dilators cause undue dilatation of all the superficial capillaries, resulting in a condition of angio-paralysis, causing intense and painful hyperæmia of the terminal nerve filaments, which only diminishes on the cause being removed or on relief being obtained by sweating.

I may state that this patient has never noticed any flushing or mottling of the skin during his vaso-motor paroxysms. His

wife on several occasions, by no means all, has remarked that he looked pale. He says he thinks the paleness on these occasions was due to anger, as he was always seriously provoked for giving up to the irritation. On one occasion when patient was undergoing my examination he had slight paræsthesia and I had an opportunity of noticing the color of the skin. It was at that time slightly reddened and hotter than normal. The paræsthesia of which he complains has been a distressing symptom, preventing patient from engaging in any work for three months during the past winter. Since the weather has become warm the paræsthesia has entirely disappeared.

Whether the lesion be organic or functional is the first question for us to consider. The persistent polyuria may be and frequently is due to gross lesions, but the fact that the renal discharge has lessened under treatment and that nerve storms, involving both sides of the body, complicated the case, causes me to regard the trouble as functional.

It may have originated and have been kept up by the free use of tobacco, the nicotine acting on the center, causing dilatation of the renal vessels and functional instability of all of its cells. I have tried to ascertain if smokers as a rule pass more urine than those who do not, but my observations are as yet of little value.

Now is the case one of diabetes insipidus? I think not. While it has in many essential particulars all the symptoms of diabetes insipidus, yet it has more symptoms which are exceptional in diabetes insipidus. Both the paræsthesia and the furuncles which this patient has had are exceptional in insipidus and his thirst has never been the thirst of a patient with true diabetes. The subsequent history of the case shows that it is not diabetes insipidus.

That history is as follows: I gave him in February nux vomica and arsenic, and later one grain of ergotin three times a day. I saw him last June 2nd inst. His pulse was 72, his temperature 98 deg. Fahr. He reported much improvement. For a week he has only had to make water from 6 to 7 times a day. On June 1st he only passed three pints of urine in the twenty-four hours. On June 2nd he passed only four pints of urine.

Perspires freely. Has no paræsthesia. Says he feels well. Has quit smoking as ordered. The examination of the urine on June 2nd showed a specific gravity of 1022, acid reaction. No albumen, no sugar. No increase of uric acid. Sulphates and phosphates not increased.

DISCUSSION.

Dr. Eskridge. The paper is well worth discussing. I only want to say a few words in regard to the treatment outside of a few remarks in regard to the nature of the case. The vaso-motor disturbance may be due to an irritant or paralyzant. If we have an irritating effect at any part of the body, we may have it causing a vaso-motor spasm; or if it continue long, we may have a vaso-motor paralysis in abdominal organs and the surface of the body may be blanched; for those cases that are inorganic the treatment is comparatively simple, although in many of them the symptoms may be obstinate unless you can thororoughly control the patient. Galvanism acts admirably in cases of vaso-motor paralysis; it does much to tone up the vaso-nervous system.

In regard to medicaments, I found nothing to equal strychnine, beginning with 1-40 to 1-30 gr. I have carried it up to 1-7 gr. twice daily; but it is very infrequent that it should be carried up to this dose. Ergotin does good also in these cases.

The patient should be prevented from becoming exhausted. Rest is good. Nutritious food must be insisted upon without stimulation as a rule. The food should be easy of digestion, non-stimulating and abundant in quantity. I believe the fault in the case which Dr. Axtell reports is due to retention in the blood of salts that should be excreted by the kidneys.

The low specific gravity of the urine justifies this view of the case. For this sodium salicylate acts well, and at the same time water should be given in abundance.

Dr. Hall.—I would like to mention in this connection, a case of limited disturbance of the vasor-motor system that struck me as being very peculiar. It was that of a young man, 20 years of age, who came to me complaining that whenever he ate an apple, one side of his face began to get red and sweat

profusely but was accompanied by no pain. I thought it must be either a mistake or due to his imagination, and having an apple I tried the man, and found that in less than one minute by the watch the side of his face began to grow quite red, and in less than two minutes, was beginning to sweat so that the drops fell off. This was several years ago, and I do not remember what I did for it. I simply remember it on account of its peculiarity.

DR. PERSHING.—The doctor's paper interested me much, on account of the prominence of vasor-motor disturbances in cases of traumatic neuroses. I cannot add anything beyond what has already been said; but I have been convinced that in some of these cases, vaso-motor paralysis has been the greatest pathological factor in causing distress of the patient, and remedies like strychnia, atropia and electricity which have relieved the vasor-motor paralysis, have seemed to do more good than anything else.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF INTRA-CEREBRAL HEMORRHAGE, AND IN THE TREATMENT OF CHOREA.

BY J. T. ESKRIDGE, M. D., DENVER.

In giving, some weeks ago, the title of my paper to be read before the State Society, "Diagnosis and treatment of some of the commoner forms of nervous diseases," I intended to bring out and make prominent some of the more salient and important features in the treatment and diagnosis of about half a dozen different forms of nervous diseases most commonly met with by the general practioner of medicine; but time pressed me so heavily that I was unable to begin my paper until a few hours before the time set for the annual meeting of the society, so that I found myself unable to complete the task that I had agreed to do. As an apology for the contribution promised, I beg to submit the following:

Intracerebral Hemorrhage: Usually the first and most obtrusive symptom of intracerebral hemorrhage is appoplexy, or partial or complete loss of consciousness, more or less sudden in its onset, and more or less prolonged in its duration. In the majority of cases, we have added the local, or hemiplegic symptoms. In the severer forms of cerebral hemorrhage there is a complete relaxation of all the voluntary muscles of the body, including the sphincters of the anus and bladder. In the lighter cases there may be only slight obscuration of consciousness; in the severer ones, unconsicousness is profound.

In a typical case of cerebral hemorrhage, ushered in by marked apoplectic symptoms, the patient lies as in a profound sleep with a tendency to stertorous and labored breathing. The skin is usually bathed in perspiration; the pulse is often full and bounding, sometimes it is small, rapid and incompressible; the temperature, at first, in all the lighter cases, is lowered from 5 degrees to 1 degree or 2 degrees, but in a few hours it rises 5 degrees to 1 degree or more degrees above normal. The temperature on the paralyzed side immediately after the shock is lower than on the unaffected side, but in a very few hours it is higher on the non-affected side. A careful study of the temperature is of considerable importance, both in the diagnosis and prognosis. The face is often flushed, sometimes pale. The urine is at first abundant and of rather low specific gravity, but soon it becomes abundant, and has a high specific gravity. Sometimes it contains albumen, but no tube casts, unless there is some renal complication. Convulsions are more common in lesions of the cortex; vomiting is most frequently met with in lesions of the cerebellum.

In nearly all except the severer cases, in which there may be complete relaxation of all the voluntary muscles of the body, there are local, or one-sided symptoms. The most pronounced of these is the hemiplegia, involving the leg, arm and face on the same side. In rare instances there is crossed paralysis, with affection of the leg and arm on one side, and face on the opposite. When the hemiplegia is complete, the arm is most affected, the leg next, and the face least of all. The distal portions of the extremities are more affected than the proximal.

Immediately after the shock the deep reflexes are abolished on both sides. They return first on the unaffected side, but they soon return on the paralyzed side and become more pronounced than in the unaffected limbs. The superficial reflexes not infrequently remain absent on the paralyzed side for several weeks. One pupil may be dilated and fail to respond to light, or both may be dilated or contracted. The eyeballs are usually fixed, and more commonly they deviate to the paralyzed side, although there may be conjugate deviation of the eyes with turning of head toward the unaffected side. The facial paralysis is limited to the lower part of the face, and the affected cheek puffs out during expiration. If the patient is able to protrude the tongue, it deviates toward the paralyzed side. Even when the unconsciousness is profound the muscles on the affected side are less toneless than on the unaffected side. The local symptoms vary some according to the location of the seat of the hemorrhage. In a given case of supposed cerebral hemorrhage, during the apoplectic state, the diagnosis has to be made from a similar condition caused by syncope, or by chloral, opium or alcohol poisoning, or by uremia, epilepsy, hysteria, embolism, thrombosis, the apoplectic form attacks occurring from cerebral congestion or from the cerebral state found in paretic dementia, and from simple apoplexy in the aged.

Syncope from cardiac failure is easily distinguished from cerebral hemorrhage. In the former the heart's action is exceedingly weak, the pulse is small, very feeble, and almost imperceptible, the face is blanched, the lips are very pale, respiration is shallow, or it may be sighing and irregular, reflex action is rarely abolished, the sphincters are not relaxed, the pupils are equal and widely dilated, and there are no hemiplegic symptoms

Chloral Poisoning: In profound unconsciousness from chloral the subject is in a peaceful and undisturbed slumber, not a voluntary muscel moves, and all is calm. Breathing is rather slow and shallow, the pulse is soft, weak and infrequent, and the temperature is usually slightly subnormal. There is complete absence of all local symptoms.

Opium Poisoning: The onset of the symptoms, if this is known, the equal and contracted pupils, the slow respiration, the normal temperature and the absence of all hemiplegic symptoms would point to opium poisoning. If the symptoms began with general or partial convulsion, chloral, opium and alcohol poisoning could be excluded.

Acoholic Unconsciousness: An alcoholic odor of the breath, a coma from which the patient may be temporarily aroused by loudly calling his name, equal pupils, nearly normal temperature, and the absence of unequal temperature on the two sides of the body, point to alcoholic poisoning. Violent struggling, when it occurs, strongly indicates alcoholism; no localizing brain symptoms.

Uræmic Coma: Albumen and tube casts in the urine suggest uræmia, but albumen is frequently found in considerable quantity in the urine in cases of brain hemorrhage, especially if it is attended with convulsions, but the tube casts are usually, if not always absent, except where kidney disease has preceded the hemorrhage. It must be borne in mind that renal disease, especially the senile form (granular disease of the kidney) occurs in about one-third of the cases of cerebral hemorrhage. The peculiar physiognomy of renal disease, with local dropsy, equal pupils, less profound coma, and usually nearly normal temperature (according to Gowers it is always sub-normal, except in cases where local inflammation exists), the presence of the odor of urine on the breath and the absence of hemiplegic symptoms occrruing in a young subject, are usually sufficient to diagnosticate uræmic coma. Gowers states, "Rigidity of limbs or local muscular twitching during the coma is, if constant in seat in favor of cerebral mischief; if variable in position it is in favor of uræmia."

Coma of Epilepsy: If the history of the patient is known and the onset of the attack has been witnessed, no difficulty will occur in the differential diagnosis. If the patient is first seen in post-epileptic coma, without any knowledge of his previous history, the absence of hemiplegic symptoms, and the short duration of the coma would serve to distinguish the case from cerebral hemorrhage, except in a condition of *status epi-*

lepticus, (a state rarely, if ever, reached without the history of the patient being known), when in the absence of a history of the case it would be almost impossible to exclude cerebral hemorrhage, in which no hemiplegic symptoms are present. Fortunately for the diagnostician, in nearly all cases of cerebral hemorrhage, attended by convulsions following each other in rapid succession, unilateral symptoms exist, but multiple thrombi and emboli may give rise to a condition resembling the *status epilepticus* without a single unilateral symptom.

Hysterical Coma: I have yet to meet with my first case of hysterical coma in which difficulty has been found in excluding cerebral hemorrhage. In the cases that I have seen, the absence of all positive symptoms of organic disease, and the presence of hysterical stigma, have rendered the diagnosis easy. The face is rarely, if ever, paralyzed in hysteria. The danger of mistaking cerebral hemorrhage for hysteria is much greater, and in some cases, can only be avoided by a careful search for symptoms of an organic nature.

Apoplectiform Attacks of Cerebral Congestion: In this condition the symptoms are general with less profound unconsciousness than is found in cerebral hemorrhage. There are no local or hemiplegic symptoms. There is usually a history of previous similar attacks which have passed off without leaving any weakness of muscles. Gowers is inclined to the opinion that in first attacks of this character a positive diagnosis cannot be made.

Apoplectiform Attacks in Paralysis of the Insane: The previous history of the patient is usually sufficient to put the physician on his guard. The seizure is ushered in suddenly with convulsions, local in seat, clonic and tonic in character, the head is drawn to one side, the eyes and face muscles may keep up a constant twitching for hours, unconsciousness is profound, the face is dark, respiration is shallow and rapid; the pulse is quick and weak, the temperature is elevated, a profuse perspiration covers the body, and the whole aspect of the patient points to a speedy dissolution.

The seizure lasts for a few hours or a day, and is followed by sleep from which the patient slowly wakes and gradually

recovers consciousness. A day or two later, however, the patient is apparently as well as he was before the attack, except mental deterioration becomes more rapid, with a tendency to the formation of bed-sores and the development of other trophic disturbance. If one were called to see a patient in a first attack of this character without a history to guide him, a diagnosis from cerebral hemorrhage would be impossible. The same character of attack occurs from cerebral pachymeningitis, and it is probable that these seizures in paralysis of the insane are due to hematoma of the dura, and the immediate cause is hemorrhage.

Simple Apoplexy: In persons advanced in life, a condition sometimes occurs with a train of symptoms that perfectly resemble cerebral hemorrhage, but at the autopsy no trace of hemorrhage, or other gross cerebral lesion can be found. Such attacks are truly mysterious in their nature, and it frequently happens that they cannot be distinguished from cerebral hemorrhage.

Embolism: The younger the patient, with the presence of endocardial disease or syphilis, the greater the chances are in favor of embolism against hemorrhage, except in cases where the apoplectic symptoms have been very severe, coma profound and long in duration. The parturient state favors embolism. The less the disturbance of temperature, provided the paralysis is extensive, the less the chances are in favor of hemorrhage.

Thrombosis: The differentiation of thrombotic softening from cerebral hemorrhage is probably one of the most difficult diagnosis that the physician is called upon to make. Gowers states that "some writers contend that we can be sure of our diagnoses in only one-third of the cases." He does not agree with this broad statement, and believes that by a careful analysis and comparison of the symptoms, an accurate diagnosis can much more frequently be arrived at than might be inferred from the writings of some physicians.

An accurate diagnosis is of considerable importance, because the treatment of the two condions is entirely different. I will give the most important diagnostic points of each.

Thrombotic Softening.	*Cerebral Hemorrhage.*
1. Prodromata, frequent.	1. Prodromata, infrequent.
2. Great degeneration of the arteries of the limbs.	2. Turgid face and strongly beating arteries of neck.
3. Pulse soft and often very compressible.	3. High arterial tension regardless of the size of the pulse.
4. Heart, feeble, dilated and irregular.	4. Heart hypertrophied and strongly beating.
5. Coma less marked in depth and duration.	5. Coma more intense and longer in duration.
6. Following grief and other depressing influences.	6. More likely to be induced by mental excitement.
7. Local convulsions more frequent.	7. General convulsions more frequent.
8. Slight initial temperature disturbance.	8. Often great initial temperature disturbance.
9. Slight variation of the temperature within a few hours.	9. Often a considerable rise of temperature twelve to twenty-four hours after the attack.
10. Secondary inflammatory symptoms frequent and well marked.	10. Secondary inflammatory symptoms less in frequency and in degree.

The above is only an attempt to arrange the chief diagnostic points of thrombotic softening and cerebral hemorrhage side by side, but it must be evident to every one that any one of the symptoms may be so modified by conditions and circumstances as to render it entirely valueless, *e. g.*, sudden fall of temperature, succeeded, a few hours later, by a rise of several degrees, indicates cerebral hemorrhage, but in occlusion of the basilar artery, the temperature may rise four, six or even eight or more degrees a few hours subsequent to the occurrence of the apoplectic symptoms.

Treatment of Cerebral Hemorrhage: I must reiterate what I have said on former occasions, in connection with the treatment of a patient while in the apoplectic state from cerebral

hemorrhage, that most of such patients would do better without medicines than they do when medicines are simply administered with the hope of doing some good, but whose administration is not governed by any logical or rational principle.

If we bear in mind that in hemorrhage into the cerebral substance, not traumatic in character, the immediate cause of the hemorrhage is the bursting of a miliary aneurism, we shall appreciate how futile must be our effort to arrest such a hemorrhage by the administration of medicines. Immediately after the occurrence of the hemorrhage the indications are to allow the effused blood to coagulate, promote the flow of the venous blood from the head, quiet the heart's action, allay the restlessness of the patient, when such exists, and to prevent an undue amount of blood being carried to the head. We can render the best service in aiding the coagulation of the effused blood by keeping the patient absolutely quiet. The flow of venous blood from the head is promoted by slightly elevating the head and shoulders, and not allowing the head to be bent forward, and thus compressing the veins of the neck. The heart's action is best quieted by small and frequently repeated doses of aconite, when there is no contra-indication to its use. Restlessness, when considerable, is most effectually relieved by a hypodermic administration of one-fourth of a grain of morphine; when it is slight, sodium bromide is effectual. Various means are at our command to lessen the flow of blood in the head, sometimes one or two, sometimes all should be employed. Brisk purgation should almost always be resorted to. If the stomach is not irritable, one drop of croton oil in ten drops of sweet oil should be placed on the tongue every hour until the bowels open freely. When the stomach is irritable ten grains of calomel should replace the croton oil. Whether calomel or croton oil is employed, an enema, consisting of one ounce of salts, half ounce of glycerine and four ounces of water, should be thrown up the large bowel as soon as possible after the occurrence of the hemorrhages. Mustard plasters applied to the back of the neck, the front of the chest and the calves of the legs aid in lessening the quantity of blood to the head. Blood-

letting is sometimes indicated, but cases necessitating the withdrawal of blood by opening a vein are probably rare. In regard to the administration of ergot in the cases of cerebral hemorrhage under discussion, I do not believe it does a particle of good, and there is a possibility of its doing harm. The practice of applying cold to the head, especially ice, in cases of non-traumatic, intracerebral hemorrhages, I believe is reprehensible. It seems rational to suppose that it may increase the engorgement of the intracerebral vessels. When the face is turgid, the head warm and the carotids throbbing, ice cloths or ice poultices may reduce the heat of the head and promote the coagulation of the effused blood.

It will be seen that the only routine treatment recommended for intracerebral hemorrhage is brisk purgation immediateley after the occurrence of the accident, to which may be added the application of mustard plasters to various portions of the body. In the subsequent treatment during the acute stage indications must be met as they arise. In the chronic stage electricity and strychnine must be used with judgment and great caution. The routine employment of these two agents to overcome the paralysis does much harm in causing irremovable contractures of the flexure of the arm and leg of the affected side. In this stage strychnine should not be employed when contractures are present, or when the deep reflexes are greatly exaggerated. We must remember that no hard and fast rules can be laid down in regard to the use of strychnine. I have seen cases in the acute stage where it, in combination with aromatic spirits of ammonia, has done good service. When electricity is applied, and it, as a rule, should not be before the end of the fourth or sixth week, the extensor muscles only should be stimulated, and during its application the extremities should be held in their normal positions. Massage, systematic exercise, Swedish movements and time, do most to over come the residual paralysis of the intra-cerebral hemorrhage.

Chorea: I wish to limit my remarks to the so-called acute chorea of Sydenham, as distinguished from the chronic chrorea of which much has been written of late, especially of the hereditary form, known as Huntington's chorea. It is use-

less in an article of this kind to take up the Society's time with the diagnosis of chorea, as but little difficulty is encountered in differentiating it from other forms of nervous troubles.

In two papers written a few years ago, in which I considered at some length the influence of the climate of Colorado in relation to mental and nervous diseases, I expressed the opinion that chorea is no more frequent, is no longer in duration and is just as amenable to treatment in Colorado, especially at altitudes varying from five to six thousand feet above sea level as I found it in Philadelphia. In a third paper, entitled "The Influences of Climate, especially the Climate of Colorado, on Chorea," I was forced to the same conclusion. After a more extended experience with the disease in Colorado, I still find no reason to change the opinion expressed in the papers just referred to. I see so many cases of chorea that have been under treatment from several weeks to three or six months, which on being placed on a certain course of treatment, yield in two, or at most, three weeks, that I believe it may be pardonable in me to give in detail the plan of treatment that I almost invariably follow in the management of chorea.

For a number of years I have refused to assume charge of a case of this disease where the parents and friends will not consent to follow my instructions. In the very mildest cases, in which there is only an occasional grimace of the face, or an infrequent twitch of the muscles of the hand or foot, I allow the patient to sit up part of the day, and spend the remainder of the waking hours on a lounge. No violent or exciting exercise, such as romping, running, etc., is allowed. The patient is placed on a nutritious, digestible, but non-stimulating diet. The stomach and bowels are kept in as good a condition as possible. The patient, to begin with, receives as many grains of antipyrine at bed-time as he is years old, and the dose is increased one grain each night until all twitching stops. At the beginning of the treatment in these mild cases, I commence with one drop of Fowler's solution after each meal, and increase the dose one drop each day until the point of tolerance is reached; then the arsenic is discontinued for two or three days, or till all unpleasant effects of the arsenic have passed

away, when the drug is again resumed at the dose reached when it was stopped. The dose is again increased one drop each day until tolerance is reached, when it is discontinued and resumed at the end of the second or third day as before. As soon as the twitching ceases, the antipyrine at bed-time is discontinued, and the patient is given syrup of the iodide of iron after each meal, in from three to ten drop doses, depending upon the age of the patient. The arsenic and iron are continued for two or three weeks after all symptoms of the disease have disappeared, and the patient has regained considerable flesh.

In all cases except the mildest, to which reference has just been made, absolute rest in bed, day and night, is insisted upon from the first. If I had to rely upon one method of treatment in the management of corea, to the exclusion of all others, I should unhesitatingly choose absolute rest in bed. When the little patient is placed in bed to begin its treatment (we will suppose it to be a little child of a few years, or not more than fifteen years of age), I am in the habit of ordering as many grains of antipyrine, three times a day, after taking food, as the child is years old, and increasing the dose one grain a day until all violent movements stop, when I begin with one drop of Fowler's solution after each meal, well diluted in water, and increase the dose one drop each day as described in the mildest cases. About the second or third day after the arsenical treatment has been added, the antipyrine is given only once each twenty-four hours, and the time for its administration is usually about eight or nine o'clock in the evening, thus securing a comfortable night for the little patient. After all but the most occasional twitching has stopped, the antipyrine is discontinued, and syrup of the iodide of iron is given in connection with the arsenic. It seems a little heroic to give a child of seven years of age, from ten to fifteen grains of antipyrine daily, yet I have given a child of eight years twenty grains of antipyrine three times daily, without the slightest apparent depression or untoward effect. Certain precautions, however, are necessary. In the first place, if there is any rise of temperature, perspiration will be free, and depression will result. I

have learned to avoid antipyrine in cases where there is much rise of temperature. In such, chloral hydrate takes the place of antipyrine. I have never carried the dose of the former to nearly that of the latter. Where there is cardiac weakness, antipyrine and chloral should be given with great care, if at all. Where such a complication exists, phenacetine with a little cannabis indica seems to quiet the patient. Valvular heart alone does not seem to contra-indicate the employment of antipyrine, but cardiac dilatation does.

Whilst antipyrine is being given the patient must be kept at rest in bed. I have seen considerable depression follow a large dose of antipyrine when the little patient has been allowed to run around. During the administration of large doses of antipyrine or chloral, the patient should be seen, at least, daily, and the urine should be repeatedly examined.

The questions in regard to arsenic in chorea: How large doses may be given? How long should the drug be continued? Should it be kept at the point of tolerance for weeks without intermission, and what unpleasant effects are likely to follow its administration in large doses, are pertinent.

How large doses of Fowler's solution may be given? As a rule children from seven to fifteen years of age will bear larger doses of arsenic than adults. So far I have never found it necessary to give very large doses to children under six years. In a number of instances I have given twenty drops of Fowler's solution three times daily to children, ten to fifteen years old, for a week or more at a time. In the majority of instances the point of tolerance is first reached when the dose has been gradually increased to some six or seven drops thrice daily. After stopping the arsenic for two or three days, or until all unpleasant effects have passed away, and resuming its administration at six or seven drop doses, as the case may be, the next point of tolerance will be attained when the dose has reached ten or twelve drops thrice daily. In most instances all twitching will have stopped at this time. If such be the case the medicine is resumed after two or three days, at this dose, but now it should not be increased. It should be given at the dose tolerated when the twitching was stopped, for a week or ten days, then

discontinued for two or three days and resumed again at the full dose; the dose is now lessened one drop each day until four or five drop doses are reached, stopped again for two or three days, and again resumed at five drop doses. Arsenic, as a rule, should not be continuously given in full doses, for more than eight or ten days at a time. By observing this precaution I have been fortunate enough to avoid the ill effects that some physicians have reported from the continuous use of full doses of arsenic.

How long should the administration of arsenic be continued after all twitching has stopped? As a rule, it should be continued for a month or more after all choreic symtoms have ceased, but not in full doses of toleration for more than a week or ten days, when it should be stopped for a few days, then the dose should be gradually reduced as recommended above.

The next question: Should the large tolerated doses be continued for weeks without intermission? has already been answered in the negative. What unpleasant effects are likely to follow the administration of large doses of arsenic, even when the point of tolerance has been established by gradually increasing the dose from day to day? Seguin states that he has never seen any serious effects follow therapeutic doses of arsenic, although he gives children as many as twenty-five drops of Fowler's solution thrice daily. Whether he takes the precaution not to use the drug continuously for more than a week or ten days at a time, I am not aware. So far I have not seen any cases of neuritis following therapeutic doses of arsenic.

Dr. Shattuck of Boston reports two cases of multiple neuritis following large doses of arsenic given for the relief of chorea. Dr. McGarvey, of San Luis, Colorado, informed me by letter a few days ago that he recently had two children paralyzed in the legs after taking large doses of arsenic for chorea. These were evidently cases of multiple neuritis. Neither Shattuck nor McGarvey state how long their patients had been taking arsenic without an intermission in the administration of the drug. Several other physicians have reported cases of neuritis following the administration of arsenic in chorea.

In conclusion, I will give brief reports of a few cases of chorea treated by antipyrine and arsenic in large doses.

Case I. Rose K.age. 14, Austria. Has been troubled with violent choreic movements (bi-lateral) for six months. She has been under treatment a portion of the time. The jerking of the limbs so violent that it is difficult to keep her in bed. She is placed on fourteen grains of antipyrine three times daily, and the dose is increased one grain each day. In four days, or by the time that eighteen grains of antipyrine are being given thrice daily, all violent muscular twitching is stopped. She is now given one drop of Fowler's solution thrice daily, and the dose is increased one drop each day, and the antipyrine is reduced to one dose of eighteen grains daily. In the meantime absolute rest in bed is insisted upon- At the end of the second week the choreic movements have nearly ceased and by the end of the fourth week she is discharged, cured.

Case II. Helma B. age 13, has been suffering with violent choreic movements of left side for three months. During this time she has been under treatment, but allowed to be up and walk around all day long. When she entered the hospital, the twitching was violent. She was placed upon large and increasing doses of antipyrine and kept at rest in bed. In a week's time all violent movements had ceased. At the end of eighteen days she was practically cured under the antipyrine and arsenic treatment.

Cage III. Chas. R. age 14, was admitted into the nervous ward of the county hospital about two weeks ago. There is violent jerking of the muscles of all the limbs and of the face. He has to be strapped in bed, as the irregular muscular action makes it impossible for him, unassisted to remain in bed. He states that he has been in this condition for six months. He is placed upon the same treatment given cases I. and II, with equally good results.

DISCUSSION.

Dr. Pershing. Dr. Eskridge's suggestion in giving arsenic, I think is of very great importance. It reminds me of a case of mine in which interstitial neuritis occurred during the administration of a full dose of arsenic in an obstinate case of

chorea. The patient had been taking Fowler's solution for four or five weeks and had reached a dose of about 13 minims when the eruption of herpes appeared, At the same time, he conceived an enormous dislike to his medicine which he did not show before, cried when he was asked to take it, and finally refused. I discontinued the arsenic and there were no evil results. That was a case that would probably have run into multiple neuritis had the arsenic been continued.

I would like to ask Dr. Eskridge if in his case of simple apoplexy there are any local symptoms at all. I would like to hear a little more definitely in regard to the case.

DR. AXTELL. The suggestion has come to me, in case we were called to see an apoplectic patient in the residence portion of the city, that while waiting for the ambulance or a carriage, it would not be a useful proceedure to apply hot cloths, hot water bottles, or the like, to the abdomen. We know that heat applied there will dilate the abdominal vessels which, when dilated, will retain an enormous amount of blood. This would lessen the force of the arterial circulation and reduce cerebral tension. It is a proceedure not mentioned by the Doctor, and one which I think would be of service.

DR. COLLINS. I did not have the pleasure of hearing all of Dr. Eskridge's paper, but the part I did hear was the portion relating to the treatment of chorea. I remember a few cases of chorea, where the intolerance to arsenical preparations was so great that we found that we would have to resort to other remedies, and in that connection, I would like to remark, that sulphate of zinc, commenced in small doses, and pushed to the point of tolerance in the digestive organs, has in a number of cases in the main been quite successful.

I have more particular reference to a member of my own family who had chorea when ten or twelve years of age. Arsenical preparations were given until the point of tolerance was reached, after which he could not take one drop of Fowler's solution. I then resorted to sulphate of zinc which affected a permanent cure in this case.

DR. WILSON. I would like to state in connection with the treatment of chorea, that I have had quick results with the

same remedies recommended by Dr. Eskridge, but in smaller and I think safer doses. Toxic cases from over doses of antipyrine have been numerous during the last year or two, consequently physicians generally are using it in smaller doses, and the demand for the remedy has decreased considerable, according to the reports from our wholesale druggists. In several cases in my practice during the last six months speedy recoveries have resulted from treatment in which antipyrine was one of the principal agents used, but it was only given in about one-half the dose recommeuded by Dr. Eskridge. In chorea the vital forces are generally more or less reduced, and anæmia is generally observed, therefore some preparation of iron is needed. I do not think it wise to be hasty in leaving off old and tried remedies when the indications point so unerringly to them as they do in many cases of chorea. Iron does not interfere with other remedies having a more specific effect. Arsenic is properly regarded as one of the most important remedies in this disease, and children bear it proportionately better than adults. Fowler's solution may be given to a child of eight or ten years in five drop doses diluted with water, the dose being increased gradually and cautiously if necessary. Ordinarily it is not best to confine these patients to the bed, or even in doors unless the choreic movements are violent. Indeed out door exercise and freedom from the mental worry of the modern schoolroom, with the remedies as above indicated will bring the most satisfactory results.

Dr. Eskridge. In answer to the question of Dr.Pershing. Were there any localizing symptoms in the case of apoplexy to which I made reference, and at the autopsy of which no microscopic lesion was found? The patient had been under my care for more than a year, suffering with partial dementia. The apopletic symptoms came on suddenly and without warning, whilst the woman was in her apparent usual physical health. The symptoms consisted of total loss of consciousness, stertorous breathing, purplish face, rigidity of the right leg and arm, with tonic convulsive movements of the muscles of the right side of the face and neck, turning of the head, conjugate deviation of eyes to the right. I saw her about six hours after

the first onset of the symptoms and had her transferred to the St. Luke's Hospital. Her temperature then was normal and the pulse was 140. The symptoms varied but little during the first twenty-four hours that she was in the hospital. The convulsive movements were almost continuous in the muscles of the right side of the face, and the right arm and leg continued rigid. Her temperature continued to rise, the muscles of the right leg and arm became toneless, but head and eyes were fixedly turned to the right and she died thirty-six hours after admission into the hospital.

I was not only confident as to the character of the lesion, but ventured to localize it. At the autopsy, held by Dr. Axtell a few hours after death, to which several students had been invited, I was much surprised after a careful and minute examination of the brain, including the membranes, sinuses and blood vessels, to find no gross lesion to account for the symptoms or death. Gowers holds the opinion that cases of cerebral apoplexy resulting in death without gross lesion are not infrequent. He may be right, but I must confess that such cases, are at present, hard to account for on this theory, and I think that yet more thorough examination will reveal these lesions.

In regard to antipyrine: I mentioned in my paper that the patient should be seen, at least, once daily, and the urine frequently analyzed. I admit antipyrine is one of our most dangerous medicines, but when given with proper precaution in nonfebrile cases there will be little or no depression; the pulse will be about normal, the patient will eat heartily and sleep well. I have two cases in the hospital at the present time that are doing well. A girl twelve or thirteen years old has taken twenty-one grains without any trouble. I kept a man, who was suffering with headache, on account of pachymeningitis, on twenty grains of antipyrine three times daily for more than a year with the effect of relieving his headache, but he suffered from no apparent depression. Of course he was kept in bed all the time.

I believe that the full effects of antipyrine can be obtained with perfect safety if the precaution is taken not to give it where there is a rise of temperature, if the patient is kept at

rest in bed. Some five years ago I tried antipyrine in small doses, and I could not succeed half so well as I have with large ones.

In regard to the intolerence of the system to arsenic, if you can prevent the violent twitching in the early stages of the disease by the free use of antipyrine, the patient will not become intolerant of arsenic, because the disease is cured.

CASES OF HYSTERIA IN MEN.

By Howell T. Pershing, M. D., Denver.

It is gradually being shown that hysteria occurs in men far more commonly than was formerly supposed. Not very long ago the proportion of male to female hysterical patients was said to be about 1 to 20, but Dana, in his recent text-book estimates it at 1 to 4. My own experience makes me believe that Dana's estimate is near the truth, and it is not hard to understand how the hysteria of males has been so often overlooked.

The diagnosis of hysteria, however, should always be made with caution; and we must keep clearly in mind a correct idea of what constitutes sufficient ground for such a diagnosis. If a patient presents symptoms which do not correspond with those of any other known functional disease and thorough examination reveals no proof of organic disease, there is a probability that the affection is hysterical. But the method of exclusion is at best liable to serious errors. Cases of incipient multiple sclerosis and even certain cases of muscular atrophy have by this method been classed as cases of hysteria. If now in addition to the probable exclusion of other diseases we find evidence of a predisposition to hysteria, the diagnosis is strengthened. The predisposition may be hereditary as shown in the family history, or it may appear only in the patient's personal

history as acquired through debilitating or painful disease, injury or a drug habit. Mitchell speaks of injuries of the nerve trunks as capable of making the strongest man hysterical. In one of the cases to follow the abuse of cocaine seemed to cause the hysterical predisposition, and in another of my cases not reported the prolonged use of chloral had a much more profound effect of the same kind.

The most essential characteristic of hysteria is the occurrence of symptoms whose exciting cause is a mental process. This susceptibility to suggestion, and the consequent fitfulness and changeableness of the symptoms, are often clearly marked, as in the first case here reported. But in severe cases of long standing this susceptibility is often lost sight of in the presence of more striking phenomena, and here we usually find hysteria revealed by characteristic seizures. These seizures are light or severe. The light ones consist of the familiar crying and laughing spells in which the emotional expression is altogether out of proportion to the exciting cause. The severe ones have some resemblance to an epileptic convulsion, and hence have been called hystero-epileptic.

The features of a true epileptic attack are a single peculiar cry, fall regardless of circumstances, tonic spasm with cyanosis and dilated pupils, followed by clonic spasm, frothing at the mouth and usually biting of the tongue. The attack occurs suddenly with only a brief warning, if any, and ends spontaneously in a few minutes. During the attack the patient never utters a word nor any sound, except the initial cry, and the movements have no appearance of purpose whatever. In the hystero-epileptic attack, on the other hand, there is often an emotional cause, a long premonitory stage and a gradual onset: the fall, if any, is not so regardless of danger; the movements, such as arching the back, struggling or throwing the limbs about indicate a purpose, though often a grotesque one; the attack may last a long time and be repeatedly renewed; the tongue is not bitten but the lower lip may be; the patient often screams or talks during the attack.

In these severe cases the state between the paroxysms may be marked by certain features called hysterical stigmata, *e. g.*,

hemianæsthesia, whose distribution bears no relation to that of nerve trunks or spinal segments, and spasms of muscles in the absence of essential symptoms of any organic disease that might cause them, contraction of the visual fields, etc. Sometimes a sudden or rapid change in the stigmata shows conclusively that they are functional, but it must be remembered that the symptoms of multiple scleroses may undergo rapid and even sudden changes.

A satisfactory diagnosis of hysteria may be based then, on:

1. The exclusion of other functional diseases especially epilepsy, and of all organic disease.

2. The existence of predisposition.

3. The occurrence of symptoms in response to suggestion.

4. The occurrence of hysterical seizures.

5. The negative facts which exclude organic disease and epilepsy are of the first importance, and are more essential to a correct diagnosis than the positive symptoms of hysteria. For a patient may have a tumor of the brain or true epilepsy and present the most conspicuous signs of hysteria in addition, and in such cases the hysteria is of little consequence in the presence of the graver disease.

In reporting my cases I shall give the simpler ones first.

Case 1. March, 1893; A. G., age 24; fireman and prize athlete. Father had convulsive seizures. Patient has always been unduly affected by a pathetic story or play and has sometimes wept at the mere thought of a sorrowful occurrence, but is one of the bravest men in the line of his duty. A few weeks ago he happened to hear a good deal said about heart failure. That night when about to fall asleep he felt a pain in the cardiac region and was terrified by the idea that it might lead to heart failure. He felt that his heart was not beating properly and broke into a profuse sweat. Unable to sleep he arose and went over to the police surgeon on duty who reassurred him and gave him a placebo. Next day he was all right until something reminded him of heart failure when there was an attack of palpitation. Since then similar attacks have occurred from time to time always preceeded by the same idea. Examination shows absolutely no indication of organic disease of the heart

or nervous system. Dr. Johnson informs me that this patient did very well under moral treatment and tonics, but had a decided relapse after seeing two of his comrades killed while trying to put out a fire. The diagnosis was established in this case by the failure to find any other disease, the predisposition evident in the family and personal history, and the marked relation between morbid suggestion and the alarming symptoms.

Case 2. June, 1892; C. B., age 33; civil engineer; of robust build. Family history good. Well until within a year when he began to use cocaine habitually in the nostrils. Two months ago an attack of weakness and numbness of the limbs, dryness of the mouth and sleeplessness was attributed to cocaine poisoning and its use was stopped. About ten days ago a small abcess formed at the tip of the nose and was properly opened. To relieve pain, which was badly borne, a ten per cent. solution of cocaine was applied externally. This was immediately followed by a feeling of great helplessness and fright. Since then he has been much distressed by poor memory, insomnia and distress at the back of the head. Nevertheless he had started on a long engineering trip, but on reaching Denver felt such distress in his head that he consulted a physician, who unfortunately told him that he was threatened with apoplexy, and that he should on no account attempt either to go on or to return home, for fear of precipitating the attack. Being greatly alarmed he then went to Dr. Bancroft, who kindly sent him to me. A very careful examination showing nothing wrong with the circulation and no organic disease of the nervous system, while the patient's manner indicated a powerful mental influence, he was simply put on iron and strychnia and assured that he could safely go on his trip if he would only pay no attention to his bad feelings. He did so and felt perfectly well for eighteen days, during which he successfully accomplished what he had to do. But while returning home he suddenly had an alarming spell in which both heart and respiration seemed to stop. At the same time a boil was found to be forming on the neck. At the first convenient stopping place he consulted a physician. While the pulse was being taken the hand and arm became numb and felt as though bursting with blood. This queer sen-

sation quickly spread over the whole body which then felt as though it were worked by electricity. I saw him a few days later and again reassured him telling him frankly that his symptoms were hysterical. He improved again but after a time he was troubled with glimmering before the eyes followed by dimness of vision. Many months later he reported that he was about well, very seldom having spells of any kind and always fighting them off.

The mental cause of the symptoms was in this case plainly seen in the effect ascribed to the application of cocaine to the outside of the nose, and the feelings coming on while the pulse was being taken. The success of moral treatment confirmed the diagnosis.

Case 3. January, 1893; J. H.; age 37; bar tender. Father asthmatic; mother liable to rheumatism. Patient asthmatic until coming to Denver. Seven years ago while alone on a long drive in which he became thirsty he had a peculiar choking spasm of the throat, and thought he was going to die of it. Similar spasms have recurred ever since, and they occupy the greater part of his attention. Lately he has been having "nervous chills" at night just as he goes to bed. He complains of various queer sensations and has a morbid fear of being alone in a small closed room or in the top of a building. He fears that he is going to be paralyzed. Careful examination reveals no sign of organic disease. Although the patient says he cannot restrain his throat spasm he can reproduce it at will. It consists of a prolonged swallowing movement with contraction of the platysmæ. The mental causation of his "spasm" and "chills" was explained to him and he has improved very greatly under moral treatment, with drugs merely as placebos.

Case 4. A. B.; 18. Some months ago the patient thought he sprained the right ankle. It was rested and bandaged but pain continued long after an ordinary sprain would have been well. It was then put in a plaster bandage, but all to no purpase; as soon as an attempt was made to walk the pain returned. Finally the patient came to Dr. Van Meter, who, believing him to be hysterical, asked me to examine him. We found no disease of the ankle which could be freely manipulated when

attention was not fixed upon it. A confident prognosis was given and he was made to take an increasing amount of exercise every day, the faradic battery being used merely for mental effect. In a few weeks the young man was playing foot-ball.

Case 2.—A; about 22. Supposes that he sprained both ankles some months ago, but has grown steadily worse in spite of treatment. On coming to Denver he placed himself in the care of Dr. Edmundson, who was satisfied that the ankles had never been injured and asked me to see him. We found the patient apparently unable to walk; indeed, he objected to standing for a few moments, saying he would suffer for days from the attempt. He was wearing blue glasses, even in the house, and said that his vision had been steadily failing of late. There was a very marked facial twitch and speech was at times peculiarly embarrassed. Taking these symptoms superficially we were both prepared to find a serious organic disease. Examination, however, showed that the eyes were really normal in every respect. The facial twitch was found to have existed since childhood, the remains of an old attack of chorea. Nothing abnormal could be detected in sensation or in the reflexes, or in the power to move any joint. On urging the patient was able to stand perfectly well. After a confident prognosis he was treated by Dr. Edmundson with faradism and graduated exercise in walking. Improvement immediately confirmed the diagnosis of hysteria and in about six weeks he was able to walk four hours every day.

The two preceding cases are not examples of traumatic neurosis but of hysteria of the ordinary localized form; there really having been no traumatism. The following case is a good example of severe trauma causing hystero-epilepsy in a somewhat predisposed person.

Case 6. J. B., age 45. Neurotic taint on mother's side. Patient a steady drinker and rather fast in his living from his youth up, though a successful and industrious business man. When 30 years old the right fore arm was crushed between cars necessitating amputation near the elbow. A few weeks after operation the patient had a violent convulsion in which a great effort was made to hold him. Similar attacks recurred for

many years, at first every few days, later at much longer intervals. Men were often called in to hold him and the more he was held the worse the attacks became. Any annoying occurrence or even the sight of a person he disliked would precipitate an attack. A drink of whiskey would sometimes prevent an impending attack. This patient is now neurasthenic and occasionally has hysterical attacks of a mild type. On being suddenly startled or by a horse rearing in the street there is a sudden stab of pain in the lumbar region.

Case 7. J. S.; Locomotive fireman. Maternal aunt had convulsive seizures. In good health before failing to pass examination for promotion to engineer about four years ago. In the winter of 1889-90 while hunting on a cold day was taken with chills and general spasms, which were kept up for a long time, the head being thrown back and the spine arched. He begged his companions to kill him saying that he would sooner die than live in that condition. Afterward he had no recollection of saying anything. He was supposed to have grippe. It was nine months before he resumed work but then felt as well as ever. He says however, his physician kept warning him that he must leave the railroad or it would ruin his health. A few months ago he realized that his health was failing and stopped work, but continued to grow worse and for a month has scarcely been able to walk. He thinks he has a spinal paralysis.

Present condition. Strong muscular development. Walks with knees rigidly semi-flexed and ankles also rigid and partly extended. Can not extend either knee or flex the ankles; when he attempts to do so the opposing muscles strongly contract and either hold the joint immovable or even move it a little in the opposite way. The knee jerks are normal. The patient is greatly startled by having them tested saying that it goes clear through to his back. There is no ankle clonus.

The electrical reactions of the muscles are normal. He makes as much fuss over the very mild electrical tests as some men would over the amputation of a finger. The special senses and sensibility of the skin are normal except in an oval patch on the outside of each leg, where the pain sense is blunted.

This analysis is quickly removed by the faradic brush but returns again. Urination always normal.

The diagnosis of hysteria is based on the hystero-epileptic nature of the original attack, the normal condition of the tendon reflexes and of the bladder (excluding myelitis and lateral sclerosis), the contraction of opposing muscles in attempted movement, and the markedly hysterical demeanor. During the short time the patient could stay in the city treatment was successful in restoring normal motion to the knees, but the ankles were not improved. Could I have had this patient long enough I would have put him to bed for a short time and then made him gradually walk again using electricity and massage for mental effect.

Case 8. August 1892; Z. G.; age 23; Mexican descent; family history good. Clear history of hystero-epileptic convulsions, beginning at the age of 16 while overworked at school. After numerous attacks in which he is said to have thrown strong men about, he recovered except his eyes remained sensitive. The attacks recurred, however, in the winter of 1888-89, and again after apparent recovery in March, 1892. Dr. McGarvey describes his attacks as lasting an hour or more and as marked by the most violent and grotesque contortions, accompanied by exclamations of "Oh, my spine," "Oh, my head," etc. The patient says that before his attacks, the eyes, head and spine all ache together. He does not remember what occurs in the attack.

The patient is small and spare, being 30 pounds below his best weight. There is no paralysis nor ataxia and no marked tremor except of the eyelids; sensibility to touch, pain and temperature, good everywhere except that touch is dulled in the fingers of the left hand. Taste and smell are normal. Hearing is impaired on both sides by middle ear catarrh.

The most interesting feature of the case was a remarkable visual defect. Owing to spasm of the internal recti he wears a ten degree prism base outward before each eye, and nothing less will suffice. Testing each eye separately vision with the prism is normal, without it it is less than 4-50. The visual fields are also markedly affected by the use of prisms, The left

field, taken without a glass, is enormously contracted, extending 6 degrees above fixation, 5 degrees below and 10 degrees to either side. Taken with a prism the vertical extent of the field is the same but laterally it extends 35 degrees outward and 20 inward. The right field is a little larger and is affected by a prism in the same way. Prisms, of course, are ordinarily useful only in binocular vision, They ought not to influence the acuity of vision, or the extent of visual field in a single eye, yet this anomalous effect was repeatedly verified both by Dr. Coover and myself. It must be attributed to suggestion.

The patient would not submit to the rest cure which I advised, and I soon lost sight of him. Dr Coover, however, operated upon the eye muscles with, I believe, good results.

Case. 9. April 1891; E. A., 32. Father's mother and two of father's sisters insane. Patient's half-sister, by same father, epileptic. Patient always delicate and liable to headaches. At the age of 16, while out of school on account of headache, fell, while running up stairs. He was said to have became unconscious and was afterward in bed for several weeks. The whole right side of his body was then numb; hearing in the right side was impaired and there is said to have been some defect of speech. He could move the right arm and leg but could not hold objects in the right hand. In a few months he had recovered, and for a number of years afterward earned his living as a book keeper, using his right hand in writing.

After being fairly well for ten years he one morning found himself unable to talk. He knew what he wanted to say and wrote it down, but could not utter a word. During the next four months he gained but a few words, and so submitted to an operation by a distinguished physician of New York, who assured him that it would restore speech. On recovering from the ether he was able to talk. There was no external wound and no soreness. The patient did not know what had been done. A couple of months after the "operation" he had a convulsion, preceded by a sensation as of something crawling in the larynx. Similar attacks occurred at intervals of a few weeks for three years. He was then free from them during a residence of more than a year in Colorado. On going to California

in January 1890, the attacks returned and have recurred ever since. Three months ago he broke down from nervous prostration attributed to over work. The right arm and leg are distinctly weaker than the left, but there is no difference between the two sides of the face. Tremor occurs on moving the right arm or leg, and the movements are decidedly ataxic. Attempting to stand with eyes closed the patient falls to the right. The knee jerks are exaggerated, especially the right, but there is no ankle clonus. Sensibility to touch, pain and temperature is greatly blunted on the entire right side, including the face and scalp, the boundary being sharply fixed in the median line. Hearing, left 35-60, right 8-60, with corresponding loss of bone conduction. Smell and taste absent on right side. Vision (tested April 10), left 5-15, right 5-25. The right field is greatly contracted, the color fields in their normal relation to each other, but the green one lies wholly to left of fixation. The left field, though larger than the right, is much contracted, and the red lies within the green. For about 18 deg. around fixation there is an area in which all objects are said to be blurred. On May 2, three weeks later, vision is found to have nearly doubled in each eye, yet the fields are of less than half their former diameters, and the scotoma in the left field has shrunk in proportion. The ophthalmoscope shows the eye grounds to be normal and there is no nystagmus.

After one of the attacks in which the mouth was bloody I found a wound of the lower lip, but none of the tongue. The late Dr. Wicks witnessed some of the attacks and gave me an imitation of one. The patient first walked the floor constantly, rubbing the hands together as though to warm them, and growing more and more excited. There was some twitching of the hands, especially of the right.

After this had lasted a considerable time he suddenly threw himself forward on the floor, where he lay for a few moments, perfectly limp. Then the right hand was jerked about and the left leg kicked. The head was now drawn back and the teeth clenched. There was no frothing nor biting and no cyanosis. The movements, which had every appearance of being voluntary, nearly ceased several times and then started

up again. The attack lasted many minutes. Finally the patient was aroused and complained of numbness in the right leg, which he kept kicking about in order to restore sensation. He was dazed at first, but soon returned to his usual condition, and manifested no disposition to sleep. It became very evident that under repeated examination by myself and others the patient was steadily growing worse. I did not have charge of him long enough to seriously attempt treatment.

The diagnosis in this case was made only after several xa minations and considerable study. The intention tremor at first suggested multiple sclerosis. But there was nothing else characteristic of sclerosis and the tremor of hysteria may be exactly like the typical intention tremor. Moreover a diagnosis of multiple sclerosis if established would not account for all of the phenomena, so the idea was given up. The apparent hemiplegia with hemianæsthesia and loss of smell, taste and hearing on the same side, suggested the possibility of an apoplectic lesion of the internal capsule, at the time the patient fell on the stairs. Against this there are several weighty considerations. The patient's age at that time, 16, is highly unfavorable to any form of apoplexy. The paralysis of arm and leg on one side without involving the face or tongue is highly characteristic of hysteria. Hemianæsthesia of the same side, though quite possible as a result of a capsular lesion, is, taken by itself, more likely to be hysterical, and the fact that the visual defect is not hemianopsia proves conclusively that the sensory part of the capsule has not been destroyed. Moreover, a diagnosis of apoplexy would still leave much unexplained.

On the other hand positive proofs of the existence of hysteria in this case are abundant. The loss of speech could not have been genuine aphasia, for the patient wrote what he wanted to say, and in either motive or sensory aphasia writing suffers at least as much as utterance. That there was a sudden lesion of the bulbar nuclei concerned in speech without other symptoms of bulbar paralysis, is of course impossible, and prompt recovery under a sham operation shows the loss to have been hysterical.

The contraction of the visual fields is such as occurs in

hysteria. The inclusion of the red field by the green never occurs, as far as I know, as a result of any organic disease, and it is vary rare in the hysteria of Americans, while comparatively common in France. The marked shrinking of the fields and of the partial scotoma in the center of the left field, while the acuity of vision increased, is utterly inexplicable except as an hysterical freak. Finally, aside from many minor facts in the demeanor of the patient which denoted hysteria, there can be no doubt that the convulsive attacks witnessed by Dr. Wicks were hysterical.

In considering these cases taken together I cannot see that they show hysteria, as it occurs in men, to differ in any essential particular from the same disease, as it is seen in women, except, perhaps, that there is somewhat less of a craving for sympathy and fuss in men than there is in women. In all its large features the disease is the same in both sexes.

INTUBATION OF THE LARYNX.

By A. G. Case, M. D., Denver.

In the consideration of this subject, I shall confine my remarks more particularly to the application of intubation of the larynx in diphtheritic laryngitis, although intubation is applicable in most cases, where operative interference is demanded for the relief of laryngeal stenosis.

Isolated cases will occur in various diseases, for instance, in scarlet fever, in measles, in œdema of the larynx, from whatever cause, in stricture of the larynx, due to chronic ulceration. But the vast majority of cases will occur in diphtheria or membranous croup. The consensus of opinion in the medical profession at the present day is, that all cases of laryngitis, attended with the developement of a false membrane, are diphtheritic in character, and identical in pathological condition, differing merely in mode of developement. Still we can not deny that

there are some able and conscientious physicians, who maintain that the disease described by the older authors, as membranous croup differs from diphtheritic laryngitis in many essential particulars. But let this be as it may, the conditions, which demand operative interference, are the same in either case. The early history of intubation is familiar to all of you, so I need not consider it.

Six years have elapsed since the operation of intubation of the larynx was first introduced to the profession in this country. Have the expectations of its advocates been realized? Has it stood the crucial test of time? Has it withstood the criticisms of its opponents, or the friends of tracheotomy, the operation, which, in a measure, it is intended to supplant?

These opponents have not been silent. They have been critical, sarcastic, and most bitter in their denunciations. One writer denouncing intubation as dangerous, unsurgical and its practice the practice of manslaughter.

From the Annual of the Universal Medical Sciences, for 1890, I quote the following from Dr. Ingalls on intubation of the larynx. He says "O'Dwyer's method for the relief of psuedo-membranous laryngitis, has during the last year, not only maintained its position with the profession but gained ground both at home and abroad, as shown by numerous reports of cases, not only by those who had formerly used it, but by others who, either have not employed the method at all, or have actually opposed it. Besides the reports of our home journals, various articles have appeared in the German, French, Italian and English periodicals."

From the Annual of 1892 (two years later) I quote the following: Johaun Bokai, of Buda-Pesth, Hungary, in giving an account of the practice of intubation and tracheotomy at the Stefanie Childrens' Hospital at that place, writes that in his earlier experience with the operation, he intubated and tracheotomized alternately, excluding from both operations, septic cases of diphtheria, and those in which the croupous process had extended into the smaller bronchi.

Since January 1, 1891, Bokai has practiced intubation as a primary operation exclusively, and has had 109 cases with 34.7

recovery. In the same class of cases, during the two previous years he had saved only 14 per cent by means of tracheotomy.

In the March number of the Annals of Gynæcology and Pædiatry, 1893, page 384, this same surgeon in reporting the results of 291 cases of diphtheritic croup, recommends highly the use of O'Dwyer's method of intubation. Of these cases there were 100 in which recovery followed, although in only eight was a secondary tracheotomy resorted to, and only once with favorable results. This author writes, that during the past twenty months intubation has entirely superseded tracheotomy, and the results led him to believe that intubation is a better practice than tracheotomy. He concludes that there are two classes of cases in which tracheotomy is called for. First, where there is at the same time marked pharyngeal stenosis, accompanying the laryngeal. Second, where there is marked œdema of the larynx, making intubation of little service.

Von Ranke reports 365 cases of intubation performed for diphtheritic croup in Germany, Austria and Switzerland during 1891, with 40.5 per cent. recoveries. He compares this with 137 tracheotomies, also by different operators, which yielded 32.8 per cent. recoveries.

Jacques, of Marseilles, reports 68 cases of croup treated by intubation, with 30.8 per cent. recoveries. Moll, of Belgium, 92 cases with 40.2 per cent. recoveries.

From the above it seems that foreign physicians are beginning to appreciate the advantages of intubation in the majority of cases of diphtheritic croup. Foreign physicians as a rule are very averse to adopting any operation or invention having its origin in America. The advocates of intubation meeting with the same opposition abroad that they met with in this country, the results are the same. The merits of intubation have only to be seen and experienced to be appreciated.

There are many operators in this country who can now number their cases of intubation by hundreds, and their per cent of recoveries is greater as they become more expert in the practice, and are able to overcome obstacles, which in their earlier experience often interfered with success. Statistics, to be of any comparative value, must include a large number of

cases, and under varied circumstances. The fallacy of striking per centages from a limited number of cases in such a complex disease as croup, in which so many factors beside the laryngeal stenosis contribute to a fatal result, is well illustrated by Dr. O'Dwyer in his third series of 100 cases. He says when he reached the eightieth case he had thirty recoveries, and following this he had twenty-five consecutive deaths.

It is only when such men as Dr. O'Dwyer, Dr. F. E. Waxham, Dr. Dillon Brown, Dr. Winthrop and others can number their cases individually by hundreds and collectively by thousands, that per centages become of comparative value. In the latter part of 1892, Dr. McNaughton, of Brooklyn, mailed circulars to all physicians having reported cases of tracheotomy or intubation, in order to collect statistics of the two operations. The statistics gathered by Dr. Naughton are now in the hands of the publisher, but the doctor kindly sent me the total results of his inquiries. The whole number of tracheotomies reported, 2,417, giving 586 recoveries, or 24.24 per cent. Whole number intubations reported 5,546, of which 1,708 recovered, or 31.84 per cent.; or in other words intubation saves of each 100 cases operated upon, seven more than tracheotomy. These reports were by many different operators, in different portions of the United States, and under varied circumstances and conditions, and give as fair a comparison of the results of the two operations as can be obtained.

It appears to me that there should not be the bitterness of feeling against intubation that the advocates of tracheotomy universally express. The object to be accomplished by either operation is the same, viz: to relieve the dyspnœa in a patient dying from improper oxygenation of the blood, caused by the laryngeal stenosis. The choice of means to be employed should be, which operation is the less dangerous, the easier performed, and which will best accomplish the object to be attained. The two operations should go hand in hand, one supplementing the other.

There are conditions in which intubation will not meet the requirements for relief which tracheotomy will, but these conditions are comparatively rare. This fact is well shown by the

small number of tracheotomies in comparion with the large number of intubations performed by the surgeons equally qualified to perform either, and well conversant with the advantages and disadvantages of both operations.

Either intubation or tracheotomy is merely a mechanical means, adopted to relieve a condition, viz: the laryngeal stenosis and has no effect upon the disease proper, from which the patient is suffering. I think physicians make a great mistake right here, after operating they trust to intubation to cure the constitutional malady. If there is any period in the history of the disease where your mercurials and other constitutional remedies, as well as stimulants and nourishment are of any benefit, it is now. When there is free oxygenation of the blood, under this favorable condition only, will your remedies have their legitimate power to avert the baleful effects of absorption of the diptheritic poison.

When about to operate it is necessary to have, at least, two reliable assistants, one of whom should be a physician, familiar with the operation; his duty will be to hold the "gag" in the patient's mouth, and at the same time to hold the patient's head in the proper position. This is quite an important point since, if properly done, it facilitates greatly the ease and dexterity of placing the tube within the larynx.

The duty of the other assistant will be to hold the patient in an upright position facing a good light, and to prevent the struggling of the little patient from freeing itself from the winding sheet in which it should always be closely wrapped and well secured by means of safety pins.

In selection of tube, I have found that a smaller tube than the one indicated by O'Dwyer's scale, is preferable. While the smaller tube will be more liable to be expelled in a paroxysm of coughing, and may require replacing, still, this very fact I consider an advantage and a safeguard, in case the tube becomes occluded by a portion of membrane. I well remember one of my first cases in which the tube became occluded, and the patient died before I arrived to remove it. Probably, had the tube been a size smaller, it would have been expelled by the coughing and the life of the patient saved. The danger

from strangulation with the tube out, is far less than with the occluded tube in the larynx. And often when the tube is expelled on account of becoming occluded with membrane, the membrane is also expelled, after which it may be unnecessary to reinsert the tube. And another feature in favor of the smaller tube is, that it will settle a little lower in the larynx and allow the epigtlotis to drop lower, and more properly perform its legitimate function in the act of deglutition, thereby lessening the difficulty of administering liquids and nourishment.

After placing the tube within the larynx, which should be accomplished in a few seconds of time, the peculiar cough with the expulsion of mucus from the trachea, will indicate to the operator that the tube is within the larynx, and not in the œsophagus. I think it better to wait for a time before severing the thread. I wait until I am convinced that the tube is relieving the dyspnoea and that it is not at all occluded with any particles of membrane, or that there has been no membrane carried down in advance of the tube, a condtion which will make itself manifest at once by the increased difficulty of expiration. When I find the condition satisfactory I sever the thread. I notice that with most foreign operators the thread is left in place some time. They remove the tube frequently to administer medicine and nourishment, but with the improved manner of feeding this is unnecessary, and I think it better to remove the thread.

The matter of medication and nourishment will be the next obstacle to be overcome. I have often noticed that when the tube used was under the scale size, I had less trouble from liquids or food finding their way into the tube producing troublesome cough. I have often refrained from giving nourishment by the mouth, but depended entirely upon nutrient enemata; also I find that often stimulants and constitutional medicines can be advantageously given per rectum administering nothing by the mouth save local treatment. In some patients semi-solids can be taken readily. But the best method for feeding after intubation is the method brought before the profession by Dr. W. E. Casselbany, of Chicago. It consists

of placing the child on an incline, the feet being elevated; the exact position to obtain the best results varies in different patients from 45 to 90 degrees. Some patients take liquid better on their back and some quite as well while lying on the abdomen. Infants at the breast or taking food from the nursing bottle, can easily be placed in this position on their side or abdomen and take their nourishment readily. This device is of incalculable benefit especially in infants who are incapable of taking semisolids, and do not well bear rectal alimentation.

I think the injurious effects of a little bland liquid finding its way into the trachea and producing "food pneumonia," as it is termed, is greatly over-estimated, and I believe many a case dying from croupous pneumonia, which was induced by the continued dyspnoea, before intubation was resorted to, is attributed erroneously to this cause.

The dropping of the tube below the vocal cords into the trachea is an accident which may occur, and has happened with several operators, but with our present improved form of instruments is not liable to occur.

And now in conclusion what can we claim in favor of intubation? First, it has withstood the test of time. While many so-called discoveries, or inventions, have been presented to the medical profession in the last six years which have been tested and found valuless, intubation is more popular today than ever before. There is no city of any size in this country, or I might say in Europe either, that does not contain one or more surgeons who are enthusiastic in the use of O'Dwyer's tubes for the treatment of diphtheritic croup. Second, the comparative ease with which the operation is performed by one who is rearonably expert in the practice. Third, the comparative absence of danger attending the operation when properly performed. Fourth, the statistics from large numbers of cases give larger percentages of recovery than by any other method.

With all these advantages considered, I deem any physician derelict in his duty to his patient, at the present day, who does not resort to intubation when other means have failed to give relief in cases of diphtheritic croup.

RFPORT OF AN OPERATION FOR REMOVAL OF A FOREIGN BODY FROM THE AIR PASSAGES.

By F. D. Green, M. D., Pueblo.

On Saturday, June 10th, Dr. Patterson brought me a patient for laryngoscopic examination, giving the following history:

On Friday, April 7th, 1893, Vera O., aged seven while eating parched Indian corn, accidently drew a grain into the air passages. At first there was little interference with respiration, less on assuming the recumbent position than in the erect. On April 9th breathing was so difficult that Dr. Patterson called in Dr. Dorland, who performed tracheotomy. Breathing immediately became better, and Dr. Patterson immediately began training the throat, which was very sensative, to the use of instruments. After a few days training, he was able to locate the grain just above the vocal cords. Dr. Dorland, however, failed to see it. Closing the tracheotomy tube, inspiration was difficult but the child could phonate.

After eight weeks the child developed quite a cough and Dr. Patterson lost sight of the grain, after which, on closing the tube, the child could inspire with a great effort, but was unable to phonate. Dr. Patterson came to the conclusion that the grain had passed below the cords, but was still unable to locate it. On making a laryngoscopic examination, I found the larynx blocked with mucous so that it was impossible to obtain a view of the cords. As the child was very suspicious, I ordered a spray to be used and the child to be brought back the next day. On June the 11th., the father brought the child to my office and on examination I located the grain just below the cords, the small end being wedged between them in front.

On June 14th., I received word from the father that he desired me to operate, and with the assistance of Dr. Patterson, the following morning we proceeded. After chloroforming the patient, I made several unsuccessful attempts to remove the grain with forceps, each time failing to grasp the grain. We then removed the tracheotomy tube, and after elongating the

tracheotomy wound upward were successful in grasping the grain with a small pair of forceps passed upward. As we feared there might be some considerable inflammation caused by the long stay of ten weeks in the larynx, we decided to leave the tracheotomy tube in for a few days. The child, however, breathed freely on removing the inner tube and stopping the entrance. On June 19th, as there had been no inflammation of the larynx, we removed the tube, freshened the edges of the wound and closed it with cat-gut sutures. On recovering from the anæsthetic, breathing was normal and phonation easy, but voice a little husky. We felt quite elated over the successful termination as, according to Bosworth, about twenty-five per cent. of the cases operated upon die.

FLIES AS CARRIERS OF INFECTIVE MATERIAL.

By Coppen-Jones, M. D., Denver.

Considering how much is known of the etiology of infectious diseases and the chemical and structural changes they give rise to in the animal body, it is somewhat surprising that we should be almost entirely in the dark as to the channels of infection, the ways and means of migration of the disease germs themselves. With the exception of typhoid, cholera and a few other disorders where water is the proved vehicle of transmission, we have but vague ideas as to the mode by which these dangerous ferments are spread abroad, and in many cases characterized by the exquisite infectiousness of the malady, we are without any knowledge whatever of the manner of transfer from individual to individual.

Our information as regards the migration and distribution of the higher plants and animals is abundant and extended, but what Darwin and other zoologists did for them has yet to be done for the micro-organisms of disease. One of the earliest and most important steps in this direction was taken by Cornet, who, in a

long series of refined and methodical experiments came to the conclusion that the chief factor in the dissemination of pulmonary phthisis is the inhalation of dust-laden air containing the dessicated, pulverized sputum of consumptives. His results and his conclusions are in my opinion unimpeachable, but they are nevertheless indirect, not immediate proofs. Neither he nor anyone else was able to demonstrate tubercle bacilli in the dust or air of dwellings. Attempts to do so have been hitherto always unsuccessful. Theodore Williams maintained in 1883 to have found tubercle bacilli in the air of some of the wards of the Brompton Consumption Hospital, but there is little doubt, if any, that, as Celli and Guarnire pointed out, they were not bacilli but crystals of palmitin and stearin, which stain in a manner similar to tubercle bacilli, and which it requires considerable experience and good objectives to distinguish from the latter.

Whilst reading Cornet's work it occurred to me that it would be worth while trying to ascertain how far insects might be instrumental in spreading tuberculous matter, and naturally in the first place what the common house-fly was responsible for in this respect. The belief that flies disseminate infectious substances is a very old one, but experimental proof has been hitherto wanting. They have been long looked upon as answerable for many cases of wound poisoning and in Egypt they are regarded as being an important agent in the spread of ophthalmia.

The earliest experimental proof was brought by Grassi about ten years back. He found the eggs of tape-worms in the excreta of flies and showed that even larger bodies than these could pass through the body of the fly unchanged. In 1887 Spellman and Haushalter published in the *Comptes Rendu*, a paper in which they stated that they had found tuberle bacilli in bodies of flies captured in vessels containing tuberculous sputa. Two years later a German named Hoffmann stated in the *Korrespondenzblatt des Sachischen Aertzhierims* that he had induced tuberculosis in rabbits by inocculating them in the anterior chamber of the eye with the droppings of flies that had fed on tubercle sputa. To anyone who has worked practically with the

bacillus of tuberculosis it must be apparent that results such as this can only be regarded as tentative until corroborated by repeated observations and experiments varied in such a way as to eliminate every possible source of error.

There are two questions involved. 1st. Are the excreta of flies that have been feeding on disease infectous matter still capable of setting up infection. 2nd. Is this the only source of danger or do they carry disease germs on the surface of their bodies, wings, feet, etc.

In order to answer the first question I allowed some flies to feed on fresh muco purulent sputa and after an interval of some hours shut them in a glass flask until the next day. After about 24 hours had elapsed I found numerous fly spots on the sides of the glass; these I took up with water and made coverglass preparations, which I stained by the usual Ziehl-Niellsen method. In these preparations tubercle bacilli were abundant, and showed themselves, as far as the color reaction was concerned, unchanged. Pus cells were no longer visible, but the bacilli occurred as in the sputum often in little clumps of three or five. To determine whether the passage through the fly's body had injured them or weakened their power of growth I adopted an indirect method. For obvious reasons it was impossible to isolate the tubercle bacilli themselves by reason of their slow growth so I employed a bacterium, bacillus prodigiosus, whose powers of vegetation are very great, and which, by the production of a scarlet pigment, is conspicuous in its youngest colonies. It is at the same time an organism, whose existence to external agencies may be regarded as about equal to those of the tubercle bacillus. Portions of pure culture taken from the surface of potatoes, such as you see here, were mixed with tuberculous sputa, in such quantities that there were about equal numbers of B. prod. and B. tub. present. I then fed flies upon it and removed them to sterilized glass. The next day I innoculated fresh sterile media with their excreta and was delighted to find countless colonies of B. prodig. These experiments taken in conjunction with those of Hoffman and Spillman show conclusively that we have in flies an agent in the dissemination of tuberculous virus whose importance can scarcely be over-estimat-

ed. It seemed, *a priori*, probable that by mere contact with infectious matter, a fly could carry off sufficient bacilli, or enough of it to set up the specific fermentation on suitable soil, and to obtain direct proof of this was not difficult. I sterilized a large glass jar about a yard high with chloride of mercury and suspended at its summit a watch glass containing muco-purulent sputa mixed with an agar cultivation of B. prodig. On the table underneath the glass bell were placed four halved potatoes sterilized and prepared by the usual methods whilst the corresponding halves were set under another glass as a control. I then introduced five small flies, and I may mention that these flies were caught in another house so as to exclude positively the possibility of chance infection. After three hours the flies were taken away and the potato discs left to further development. During the three hours that the flies were under the jar they had explored every inch of it and I saw them several times standing on the edge of the watch-glass touching the sputum with their anterior legs and proboscis. I also watched them run over the surfaces of the potatoes but it was always in a hurried and pre-occupied manner, and only in one instance did I see a fly remain for about thirty seconds on one spot about an inch in area, examining and investigating as flies are wont to do. This place I marked by sticking a sterilized needle into it. After 48 hours all the potatoes were covered with minute colonies of bacilli prodigiosi such as you see here, only much more numerous, whilst at the spot where the fly had remained for half a minute the colonies were so thick as to run into one another and prevent enumeration.

I then turned my attention to cholera using choleraic dejecta in place of tuberculous sputa and gelatine plates in place of potatoes. The results I obtained were similar in every respect. Whilst I was engaged on these experiments however, a paper in the *D. M. W.* by Simmonds, of Hamburg, detailed investigations made by him on flies caught in the mortuaries and dissecting rooms during the epidemic of last autumn. His results agreed in every particular with those I had obtained for the tubercle bacillus. He found the cholera germ present and still living in large numbers in the intestines of the flies. These

facts are unanswerable and the hygienic lessons they teach are not to be mistaken. It were both superfluous and unfitting, ladies and gentlemen, did I enlarge upon them here, "to point a moral or adorn a tale." It suffices to remember the thousand and one ways in which the living body, either directly by inhalation or contact, or indirectly through food or water, can become by the agency of flies the recipient of the living ferments of disease.

Many practical hygienists may look upon such experiments as hair-splitting or making mountains out of mole-hills, but it should be remembered as has been said already, that there is such a thing as falling over a mole-hill in consequence of one's head being too high to see it. So long as it cannot be proved that one single pathogenic germ falling upon suitable soil is not capable of setting up the specific disease, so long must we recognize and acknowledge the importance of these minor portholes of infection through which the vessel may be swamped and wrecked as readily as through the larger and more conspicuous openings.

SYMPOSIUM ON ANÆSTHETICS.

Dr. Hall.—I was informed some weeks ago when I was first asked to open this discussion, that papers would be limited to ten minutes, and in order to be sure not to exceed that time I have committed the remarks which I desired to make mostly to paper.

I mentioned to the chairman of the committee on arrangements some weeks ago that it seemed to me that it would be very interesting to have a discussion of the question of anæsthetics at this meeting. He asked me to open such a discussion.

I presume we need not consider other agents than ether and chloroform, since they are almost universally used in this country. A few physicians employ the A.C.E. mixture, but, as

excepting in dentistry, none of the other agents have come into any extended use.

This symposium is intended, I understand, rather to bring out the personal experience of the parties discussin g the matte than anything else. My own position I can state very briefly: It is that, as a very wide range of statistics have shown that ether is from five to ten times as safe as chloroform, it should ordinarly be employed unless some contra-indication exists, or a condition of the patient in which the latter agent is comparatively safe. I believe no one would deny the statement that ether is safer than chloroform, and I believe on the other hand that it would scarcely be denied that all the other advantages lie on the side of chloroform. I believe we are all apt to use one of the agents to the exclusion of the other to a greater extent than we should do, for the advantages of one or the other may be so marked in certain cases that it should be given the preference regardless of prejudice against either.

There have been about 500 cases of death from chloroform reported since it was first used, but I believe none have occurred in the use of this anæsthetic in labor when given by a physician. Under these circumstances I believe that on account of its more rapid action and the consequent fact that less of it is needed to produce the desired effect, we are justified in using it in labor, when it is not necessary to produce full surgical anesthesia as for operative interference. It is necessary to begin its use only with the advent of the pain, while the action of ether is so much slower, that its results do not become apparent soon enough, ordinarily, when used in this manner. My obstetric experience has not been large, but I have records of 115 cases of labor in private practice, in which it was thought best to use an anæsthetic. In 13 cases ether was chosen, and in the balance 102, chloroform. In most of the cases in which prolonged operative interference was needed, ether was used, although of late, I have used chlorofrom almost entirely under such circumstances. While I have seen nothing to indicate that the anæsthetic used was likely to produce *post partum* hemorrhage, I have no hesitation in stating that I think forceps

will be demanded oftener when an anæsthetic is employed than when omitted.

Then again, it seems to me that the dangers of chloroform are rather to be assumed in certain cases than those of ether. In operations at night in close rooms when open lights only can be obtained, I think the danger from fire from ether is greater than that of heart failure from chloroform. One practitioner in an eastern state recently set fire to the bedding in two cases of labor inside of one year from the ignition of the vapor of the ether used, and this ignition has taken place at a distance of even fifteen feet from the candle.

In a recent case it seemed to me best to use chloroform on account of the presence of tuberculous ulcer of the larynx, because of its less irritating character. For the same reason it is preferred by many in tracheotomy when an anesthetic is needed. It seems to be pretty well established that the danger of œdema of the lungs, or suppression of the action of the kidneys and of severe vomiting after an anesthetic, are all greater after using ether, and in cases where these factors must be considered it seems to me that chloroform ought often to be considered. Childbirth is said to offer almost certain immunity from the dangers of chloroform.

It seems to me to be a mistake upon the part of certain very excellent medical schools to teach the use of one of these agents to the exclusion of the other. Thus during four and a half years of medical study I never once saw chloroform used, while no doubt others have seen it used exclusively during their student life. It should be borne in mind that in many places ether cannot be obtained, while in time of war the advantages of chloroform render it much the more useful agent for field service. In such cases the advantages of a familiarity with the use of the latter drug are self-evident. It seems to me that in certain districts it should be more widely known that some of the United States lie west of the Alleghany mountains, and that in hundreds of towns there it is so common to use chloroform that one cannot obtain at short notice ether fit for anesthetization. In this region it is not uncommon to have to depend for an assistant upon one so unfamiliar with

ether that it is dangerous to use it, or at least almost impracticable under certain circumstances. For years I kept my own supply of ether in order to avoid being caught without it; but I believe it is safer to allow a man familiar with chloroform to use that drug, rather than ether, if unfamiliar with the latter, when it is necessary to complete an operation as quickly as possible. I think there is no question that chloroform well given is safer than ether badly administered under such circumstances.

I think there is room for some improvement in the manner of administration of either of the drugs under consideration, but particularly perhaps in the case of ether. Many of us were taught to use a sponge of about the size and shape of a hat crown, which absorbed ether sufficient for several administrations before giving off the vapor freely. The cone seems to have come into more general use of late, and I think is a decided improvement. I think it is much better to have the ether vapor absorbed as rapidly as it can be, without producing too much irritation, than to take thirty or even sixty minutes for producing its effects, as we have all of us seen done at times. The tax upon the eliminative organs must certainly be more severe in the latter case, and especially if a prolonged operation follows. I believe the danger from ether to bear quite a close relation to the length of time during which it has been given, a point not as commonly brought out as it should be. This relation is certainly much closer than in the case of chloroform. I have no doubt that a certain proportion of the cases of death ascribed to the after effects of ether should be more properly set down to slowness upon the part of the surgeon, for all of us have had occasion to note the pallor and other signs of shock due solely to the anesthetic in cases where no blood has been lost, but where it has been necessary to continue the administration of ether for a long time. This cannot but be prejudical to the welfare of the patient, and should be avoided if possible.

Knowing as we all do, the dangers of anesthetics, it seems to me that no one should undertake their administration without having at hand the necessary restoratives and instruments

which would suffice for the performance of tracheotomy if needed. The latter contingency is certainly rare, but in one case I have seen death averted by its promp performance when a considerable clot of blood had lodged in the trachea and stopped respiration.

It seems to me that there are certain advantages in the use of some of the recent inhalers for giving ether, which more than counterbalance the objections which have so long prevented their coming into general use. I have for several years used a Clover's inhaler with a good deal of satisfaction, although not to the exclusion of the cone by any means. That it is not necessary to open a pound can of ether and set another one close at hand for the ordinary surgical operation as I have often seen done. I shall try to demonstrate by quoting five successive cases which I have recorded, taken just as they occurred in my own practice. Of these cases the first four were completely anesthetized and the fifth almost so with the contents of one 8 ounce can of Squibb's ether. They were:

1. A woman of 42, etherized for a dentist, for the extraction of teeth. Time about twenty minutes.

2. A woman of 19, etherized for dilatation of cervix uteri for dysmenorrhea, associated with a sharp anteflexion. Time 1 hour.

3. A boy of 6 years; dislocation of both bones of elbow backward. Time about 10 minutes.

4. A young married woman; vaginal dilatation for dyspareunia and dilatation of cervical canal for dysmenorrhea. Time 35 minutes.

5. About an ounce of ether remaining, sufficed to anesthetize a man of 55 for operation for fistula in ano.

This is an average of a little less than two ounces to each case and two of them had to be very thoroughly under the influence of the drug for operations upon the genital organs. There can be no doubt, I believe, that vomiting after the recovery is less common when the ether is given quickly and eliminated in the same manner. But two of these patients vomited, one once, and the other twice I believe. These are

not at all selected cases, but are given as they occurred after opening a new can of ether in regular succession.

In ten years practice in this state, I have but once seen serious symptoms from the use of an anesthetic. In this case I employed the only physician available, a homœopathic practitioner, to anesthetize a man for primary amputation at the upper third of the thigh for railroad injury. As he was not familiar with the use of ether, I consented although rather unwillingly, that he should give chloroform. Although it was carefully administered, the pulse and respiration ceased, for a moment, but the patient was restored without great difficulty

There is one matter more that I have thought of since writing the paper, and that is the danger of giving anesthetics without another physician being in attendance at the same time. I have had about 400 cases where I have been compelled to give either one or the other of these anesthetics without another physician, for the reason that there was not another one within 45 miles; but I hope I shall never be placed in a position where it will be necessary to do it again, as I never have done it without a mental protest.

I feel a little embarrassment in opening this discussion, as I know there are a number of gentlemen here who were giving ether before I was born.

I do not come here as the juryman did in the murder trial, believing that the man is guilty, and ready to hear any evidence tending to confirm that belief; but feel that I am ready to reopen the case and hear any new arguments on the other side at any time.

I have seen some men who had apparently the idea that they knew everything when they left the medical school, and felt that if they were only certain that they did not forget anything, it was unnecessary to learn anything more. The attitude these men assume, reminds me of that of the German farmer whose son threw the 100 pound stone, which for generations had served to balance one end of the sack while the grain was carried in the other on the way to the mill, over the mill-dam. The son stated that it was not necessary to make the horse carry the extra weight, inasmuch as half of the grain could be

put in either end of the sack. The remark of the father was to the effect that he would not send the boy to school any more for he "believed it was there that he learned all of these Yankee improvements."

DR. PFEIFFER.—It was my privilege after three years in medical school, to serve as interne in the hospital in which ether was discovered, and to have hammered into my head, the various points in etherization that were learned by men in their student days who had assisted in the discovery of ether. I do not, therefore, claim to have a "corner" on the requisites for proper etherization, but I claim in that way, an experience, which was of great value in after life. On that account, however, I have been accused of being a partisan of ether. I mention that fact and would add further that I have acquired impartiality in looking at the question, for the following reasons:

The facts as regards statistics are these: That one out of 2,000 patients taking chloroform may die, and one out of 20,000 taking ether may die. You notice I use the words "may die." In short, it is ten times safer to give ether than chloroform. I have to admit that I never looked upon the administration of ether as especially dangerous.

It came to my notice from time to time when instructed to give ether, that a child seven hours old could be etherized in the same manner as a grown person, and I have done it; then I have etherized a man 85 years old; have etherized a person with heart disease; persons with Bright's disease and a boy with empyema.

Chloroform can not be used with safety in cases of a weak heart; and in a great number of cases you can not tell when you are going to operate on a person with a weak heart. You may think the patient to be depressed at the idea of the operation and his heart is weak on that account; you go ahead, give a few sniffs of chlorofrm, and the person is dead.

Chloroform has its advantages; in a healthy person it is safe when properly administered. Chloroform will have the preference in time of war, as it is less bulky. It is also the proper anesthetic to be used in operations around the throat. We know when ether is to be used, we have to wait and let it be exhaled

from the lungs; or if we use it in this class of operations we have to put in a wet towel over the sponge. Chloroform is very useful in cases of tracheotomy, as it does not irritate the throat, causing excessive mucus secretion, nor do you have the vomiting after it. Another advantage about chloroform is that you can drop a lighted match in it and it will not ignite.

When I was a student we classed the relative advantages in this way: Ether stops the breath first; this you can start up again. Chloroform stops the heart, which you can not start up again.

I have never seen a dangerous inhalation of ether that was not rendered safe at once by taking off the inhaler. Chloroform on the other hand suffocates in the start. It depresses the circulation and the respiration, it puts the patient into a quiet sleep, and if you have any weakness of the heart it will stop beating. To resuscitate a patient that has arrived at this condition is extremely rare, and we all know that patients die under the effects of it.

It is a very important thing to know how to administer ether. The first time I etherized anybody I had been two years a medical student, and was in the operating department; I thought the proper way to give ether was to give it, and pretty soon the patient got so blue that the surgeon came around and gave me a lesson that I never forgot. After I had etherized three months I thought I knew it all. After I had etherized six months I concluded that I did not know so much; I have learned ever since.

When I am administering ether I feel that I am driving a horse that I have well in hand; when I am present where chloroform is preferred I always feel that the horse I am driving is likely to take the bit in his teeth any moment and run away. Consequently, in view of the foregoing facts, when I have an average patient in average health and average strength, if I can procure ether instead of chloroform I do not feel justified in giving chloroform, for the reason that ether is ten times safer. My experience in ether has been confined to sulphuric ether. Ether is safe, chloroform is unsafe, and the various mixtures

combining the different ethereal liquids are dangerous in proportion as ether and chloroform enter into their make up.

DR. HAWES. In the ten minutes alloted to me in the discussion of this many-sided subject, I cannot by quoting from the books and authors, give you, who are fairly faithful students of these sources of information, any ideas you do not already possess. I can repeat to you what many authors say, that ether is safer than chloroform. I can quote to you that while ether is composed in part of oxygen, chloroform is devoid of this life-sustaining element. I can show you from statistics that ten deaths have followed the administration of chloroform where one has followed the administration of ether, yet I come before you today advocating chloroform as an anesthetic. You ask: "Where do you obtain reasons for such heterodox views?" You exclaim: "That no well-informed physician, careful of his reputation, should repudiate the conclusions of the great majority of the educated professional men of this enlightened country." Let me reply, that while ether is regarded as the safer anesthetic in this country, its alleged superior safety is not sufficiently apparent to the surgeons of Germany, France or Italy, to lead to its adoption by them. The surgeons of these countries are almost universally chloroformers. They have recognized that while one patient under chloroform may die upon the table, ten patients to whom ether has been administered may die within a few months or years as a result of disease of the kidneys, dating its origin from the administration of ether. I could weary you quoting eminent authority showing the superiority of ether, and then weary you again by offering refutations of these reasons by equally eminent investigators.

The comparative safety of anesthesia by chloroform,is not to be shown by argument and theory. It depends upon facts, and when I speak of anesthesia by chloroform I mean chloroform properly administered. I have been a practitioner of medicine now for more than a quarter of a century. In that time far more than the average amount of surgical work that comes to the village practitioner, has fallen to my lot. I state it modestly when I assert that I have administered and have had the supervision of several thousands of cases of anes-

thesia by chloroform. In all of that number, when the anesthetic has been properly administered, I have not seen a case that has given me alarm. Do not understand me to say that every fatal or dangerous case of narcosis by chloroform is due to mal-administration of it. Excellent observors have reported such dangerous cases and assured us that the administration was carefully performed. We are here largely to give our professional views, and I simply repeat that when the anesthetic has been properly administered I have never personally observed a case that has given me alarm. Have I never seen a dangerous case of narcosis from chloroform? I have, indeed; twice in my own office, I have had to recuscitate patients from what seemed inevitable death; but in these cases I was not the administrator. I was not responsible for the administration, and the administrator, although a graduate of a reputable regular medical college, knew just as much about the proper administration of chloroform as I knew of the function of the pineal gland.

Do you discard an anæsthetic because its administration is accomplished by dangerous symptoms; then you would throw away one-third of the articles of the materia medica.

Chloroform is par-excellence, the obstetric anæsthetic, and, although it has been subjected to the most virulent attacks, it is remarkable how few fatal cases can be charged against it.

A few years ago Dr. Lusk, of New York, collected a series of cases showing the danger of chloroform; he published these, seven in number. To collect them he was obliged to go outside of his own city, outside of his own country, and even outside of the profession, for in one of the cases reported administration was performed by a hospital nurse. A recent credible authority says that up to a few years ago not a single death from chloroform had occurred in labor, when the anæsthetic was administered by competent persons. Do not take for granted that because a doctor has given an anæsthetic it must have been given properly. I have seen operations suspended in two of the best hospitals in America, from the improper administration even of ether.

What shall I say to those physicians whose experience with chloroform is small, and whose dread of it is great. Treat it as

you would a high bred powerful unbroken colt, handle it gingerly perhaps at first, but handle it. When you have come to be familiar with it and to know it well you will find it a most valuable help and could not be persuaded to part with it. Experiment with it yourself, but only in the presence of another physician. Experiment with it upon the lower animals, and if you kill a few it will add so much more to your information, besides it will be to your credit as a citizen; cats are cheap and dogs are a curse. You will soon learn to have confidence in it, you will allay your patient's fears by your own fearlessness. A timid chloroformer and a terrified patient produce in both a disgust for chloroform. The first six or eight breaths should be largely diluted with air; as the sensibility of the air passages diminishes the percentage of chloroform should be increased, and when your trusting patient has inhaled enough of the sweet antidote to pain to accomplish the purpose your work has been well begun; but not all cases will have an experience so desirable. One is nervous and fears suffocation at the outset; don't strangle him with a larger dose of chloroform. A dose of assurance is what is needed; a moment later he is intoxicated. Dont mistake intoxication for asphyxia.

Another patient manifests irregular breathing at the outset, his pupils are contracted, the color of his face normal, the heart is regular, chloroform has not drowned his respiratory center, punch him in the ribs, he will breath regularly in a few moments, so long as there is a fair color of the face, contracted pupils, regular heart beats, regular respiration, have no alarm; and the absence of all these may be due only to an irritated stomach.

Experience with a hundred cases will teach you what books cannot teach. Books alone cannot make a good chloroformer. The proper administration of an anesthetic is not asphyxiation of the patient, as is often seen when ether is given. It is not dawdling along for a half hour wasting all that time, and perhaps three or four ounces of chloroform before your patient is unconscious of the surgeons knife. The average patient should be rendered unconscious with a drachm of chloroform in less than four minutes.

Finally, to the physician without experience I would say, if you don't know how to give an anesthetic give ether. If you do ever learn to give chloroform you will give nothing else.

DR. ESKRIDGE. In the presence of so many surgeons who are almost daily made practically familiar with the various anæsthetics, I hesitate to say anything on this subject. Some twelve or fourteen years ago, I was engaged in studying the surface temperature of the body during anæsthesia, especially ether anæsthesia, and in connection with these observations, I noted the effects of ether and chloroform on the deep reflexes. At that time Dr. W. W. Keen, of Philadelphia, was surgeon to the St. Mary's Hospital, to which I was attending physician, and through courtesy of this brilliant surgeon, I am indebted for the privilege of studying the tendon reflexes during anæsthesia, It was found that if ether were rapidly given to the point of complete surgical anesthesia, immediately after the patient became accustomed to inhaling it, the tendon reflexes became greatly exaggerated, and remained so for some time, whereas if ether were given slowly, and fifteen or twenty minutes were consumed in accomplishing the first stage of anæsthesia, the tendon reflexes would sometimes be abolished.

In the use of chloroform on the other hand, the tendon reflexes were rarely increased, but remained normal or were abolished especially if much depression attended its adm inistration.

The inference to be drawn from these observations is: that in the administration of ether, it should be given rapidly to the point of complete anesthesia, in which condition, the patient should be kept during the operation, taking however, the precaution to let the patient inhale gradually, of the first few inhalations of ether, so that he may not become frightened at the suffocating sensations it at first produces.

That chloroform and ether are both dangerous, there can be no question to the contrary. The former has been said to kill by the heart, and the latter by the lungs, but more recent investigations have shown that during the administration of ether, the heart or the lungs may begin to fail first. Whilst however, both ether and chloroform may kill by their effects

upon the lungs or heart, yet the former seems to effect the lungs more than the latter and the latter affects the heart more than the former.

I have seen patients who did not seem nervous or frightened with a pulse of 120 just previous to the administration of chloroform, whose pulse after they had become partially anæsthetized, decreased in frequency to 100, and finally during complete anesthesia dropped to 72, and remained there for an hour or more, when the anesthetic was properly given.

On the other hand, I have seen patients with a pulse of 70 or 80 before the administration of ether, whose cardiac beats would increase in frequency to 100 or 120 per minute, when ether anesthesia has been very slowly and gradually produced. I have not observed this effect from ether, when anesthesia has been rapidly produced.

I have observed one instance of apparent ill effect of prolonged ether anesthesia, to which I am not aware of having seen any reference. It was in the person of a young and vigorous married woman in Philadelphia, on whom Dr. A. H. Smith of that city performed a gynecological operation. Ether anesthesia was prolonged to about three hours. Two days later endocarditis developed, and she was left with a permanent valvular lesion of the heart.

I have seen albuminuria, and one case of endocarditis, follow the prolonged administration of ether, but neither of these have I observed as a result of prolonged chloroform anesthesia.

Now there is one thing that has not been mentioned tonight, and that is, the danger of nervous apprehension. A surgical operation of great magnitude is decided upon: this increases the apprehensiveness of the patient; the nervous irritability becomes greater and greater, and when the patient goes on the operating table, without any apparent cause except fright or apprehension, the pulse may be from 120 to 130 or faster. In such a case chloroform should be very carefully administered, if administered at all. Recently we had a case of this kind at the St. Luke's Hospital. The man to whom I refer was before this society today; it is the patient from

whom Dr. Rogers removed the ganglion of Gasser. I have never seen a person more apprehensive for two or three days before the intended operation, than this man was. Chloroform was administered with such alarming results, that the surgeons were very apprehensive lest the man would die, the administration of chloroform was immediately stopped, and the man was revived with considerable difficulty.

Three days later, ether was administered, the pulse was 100 at the beginning of anesthesia, but it fell to 70 and remained there for sometime. This was a case where the patient being in an apprehensive condition, chloroform was apparently more dangerous than ether.

Dr. Meil. The subject of anaesthesia, has been thoroughly ventilated, and I been have exercised to keep track of the different points brought out by members.

I have always admired the confidence with which the administrator of anaesthetics, in a hospital or without the hospital, has gone at his work. He seems to feel either much confidence in himself, and has no fear of a serious issue, or he feels that there are those about him who will help him out in an emergency.

Although somewhat familiar with anaesthetics, I congratulate myself on the safe issue of every case, whether by ether or chloroform. We have statistics on anaesthesia, compiled by several authorities; Richardson, in this country, being one. They are valuable but not authentic. Taking an average of the three principal collectors, it would appear that in one case out of 23,000 ether had proven fatal. In one case out of 3,000, perhaps 3,500, chloroform has proven fatal. In one instance in 6,000 administrations ether and chloroform in combination have proven fatal. Nitrous oxide gas has been touched on, but statistics cite one in 250,000 administrations fatal.

One who knows anything about surgery, and particularly those who had a part in the late civil war, will remember that at a certain point in the operation it sometimes becomes expedient to put the subject of the operation hurriedly to bed, that is to say, it would not look well to have the patient die on the table from anesthesia. What applied then doubtless

pplies now in private practice. We are very apt to ventilate the errors of others, but when it comes to our own errors, we are not so prone to do so; if this were done, the mortality of anesthesia from the several agents would be very different from that reported.

There are several modes of dying from the administration of anesthetic vapors: Syncopal apnoea in which the first fumes of the vapor paralyze the cardiac ganglia and the patient dies quickly.

Epileptiform syncope: At the time that rigidity of the muscles would be expected to be followed by complete muscular relaxation, death ensues, being due to tetanic fixation of the respiratory muscles, consequent interference with the pulmonary circulation, accumulation of blood on the venous side, and arrest of the heart's action. In the former instance the heart beats cease first, afterward respiration. In the latter instance respiration ceases first and the heart beats afterwards.

Paralysis of the respiratory muscles: here the patient is in the third stage of anesthesia,respiration ceases before the heart.

Paralysis of the heart: This also occurs in the course of the third stage of anesthesia; the motor ganglia are paralyzed and the heart suddenly ceases to act, respiration continues for a short time longer. This mode of dying is made up of two factors, depression of the functions by chloroform narcosis, and the shock or accident or surgical operation.

In using ether our object is to exclude air; in using chloro form our object is to admit a certain proportion of air, the admixture being 3½ per cent. of chloroform. This is rarely given attention, and I have known a disposition on the part of operators even to exclude air from without. Employing ether we can withdraw our agent should complication arise, and reaction is almost certain; but with chloroform the conditions are different, the withdrawal of the agent is not sufficient; even after operation and the patient is returned to his bed he may die from the effects of chloroform anesthesia.

I do not think that ether has the disadvantages that Dr. Hawes points out. The surgeons of Europe are now getting into the habit of using ether; they were formerly in the habit of

placing vigor and precision before safety, and chloroform has been used for this reason. The surgeons of this country are given more to conservatism.

Ether or chloroform should be selected for conditions or special requirements. Use ether if it can be used,because safer. Beginning with ether if one's patient is unmanageable, we may to overcome, add sufficient chloroform; begin the use of either agent gradually. Unless for special reasons, I do not care to prolong chloroform anesthesia beyond twenty minutes. Kocher, the well known Swiss surgeon, for protracted operations uses chloroform first, but the patient is under continuous anesthesia by ether. Stages of operations often permit temporary withdrawal of anesthetics, at such times the patient should breathe free air.

At some operations the one who does the anesthetizing is generally the one who knows the least about surgery, and for this reason he is chosen. What is the result? He goes about it in a hesitating bungling manner, and we wait, possibly with the patient exposed, and by the time the operation begins the patient is in no condition to be operated upon. Much time has been lost simply because the operator has withheld direction of the anesthetic. These are not moments of delicacy or conventionality. The question of the preparation of the patient is very often overlooked. Here is an etherization where we perhaps find the patient vomiting, not only vomiting, but vomiting undigested food which places him in momentary danger of suffocation. Anything that will imperil our patient's chances in an operation should be obviated.

Dr. WILSON.—Recently a patient invited me to administer ether for the purpose of having a dentist extract several teeth. On meeting at the dentist's office and talking the matter over, the dentist remarked that he could give the patient nitrous oxide gas and he thought the effects would last sufficiently long to extract all the defective teeth. I told him it would not if it lasted no longer than it did when I took it on a memorable occasion. A dentist in this city administered it to me and when he thought I had enough, and I thought so too, he took the gas away, and just about the time he got the forceps fitted on

the tooth the effects passed away and I got the benefit of both; therefore I consented for this other dentist to give my patient gas with some misgivings. He was longer I thought in making his arrangements for the administration than usual, but he finally announced his readiness and the patient began inhaling it, going slowly into anesthesia. He succeeding in extracting all the decayed teeth, the effects of the supposed gas lasting several minutes after the teeth were all out. It is needless to say that I was surprised. Asking an explanation as to the unusual prolonged effect of the gas, he said, "I put a little chloroform with it." I said, "Who authorized you to do that? If anything but gas was to be given it was my business and not yours. Suppose the patient had died while under the influence, would you have ever told that you charged the bag with chloroform?" Under the circumstances, the administration of chloroform was a criminal and blameworthy act, and if disaster had come would have been considered so by the court.

Dr. Lyman, of Chicago, has written a work on anesthesia, in which he states that an undue proportion of deaths from anesthesia have occurred in dental chairs. This may be accounted for partly on the supposition that other dentists than the one above referred to may be in the habit of adding chloroform to the particular anesthetic used, but more likely to the fact that less care is exercised in learning if there are any contra-indications to its use, and to the totally inadequate preparation made before hand to remedy any accident that might arise. In the dental chair the ordinary precautions in surgical operations of interdicting food for several hours previous to the operation is more frequently neglected. When nausea supervenes on account of this neglect and vomiting comes, as it is very sure to do, the patient is thoughtlessly raised from a semi-recumbent to an upright position, in order that the ejected food may reach the vessel provided for it. Very frequently have the first alarming symptoms under anesthesia been noticed while the patient has been momentarily raised to an upright posture.

I have reason to believe that in many surgical operations, all the examinations made of the lungs, heart, kidneys or brain were performed by tyros and striplings in the profession, and

in one instance where death followed the administration of an anesthetic the surgeon in charge said he was glad he had not given the chloroform.

It is considered almost universally by surgeons, that ether for general purposes, is much the safer of the two anesthetics, nor do I believe that any subsequent kidney disorder can be traced to the administrations of ether. We should place a higher estimate on human life than those do who use chloroform (knowing ether to be a safer remedy) for the principal reason that it acts more promptly and the operation can be performed in a shorter space of time. Only those like our esteemed friend from Greeley who really believe chloroform to be a safer remedy than ether, should use it habitually in practice.

Then there is another thing; when minor operations are to be performed, we frequently commence when the patient is imperfectly under the influence of the anesthestic. This is a dangerous thing to do, as is shown by the fact that many deaths either from ether or chloroform have been occasioned at the very inception of the operation, and before the patient was fully under the anesthetic. This was the case in the first death that ever occurred from chloroform. If we can guard against this and see that they are thoroughly prepared for the anesthetic, that there are no contra-indications to its use, we can give ether with much assurance from one years end to the other. Neglecting these, and giving chloroform for personal convenience, we are likely now and then, to get ourselves into trouble, and our profession into disrepute.

You will doubtless remember the case of a physician in this city who went several miles out into the country to attend a man who had been kicked by a mule, the man was drunk, and on account of the indignity inflicted on him by the mule, was raving. He was in a sitting posture, and yet, the doctor administered chloroform to quiet him. When they reached the city, to the physicians astonishment, he found his patient was dead, but still sitting upright in the carriage. When they arrived at the patient's house on Blake street, the wife finding that her husband was dead, threw both hands above her head, and screamed at the top of her voice that the doctor had killed

her husband. Who could deny her statement? Two of the contra-indications had been ignored in the administration of the chloroform, for the agent is not to be given to an habitual drunkard, nor in the sitting posture.

DR. HAWES.—I observe that Dr. Miel objects to the administration of chloroform for over 20 minutes. In one case I kept the patient under the influence for 40 hours continuously. It was a case of puerperal convulsions. Twice when I was absent, it was turned over to a person who was afraid to administer chloroform, and as a result, the patient had during each period of absence a convulsion. The chloroform prevented all convulsions, when judiciously and fearlessly administered. The patient was permitted to emerge sufficiently from the influence of the chloroform to swallow food and medicines, and finally recovered. I believe the patient's life was saved by the use of chloroform supplemented by other remedies.

DR. COLLINS.—For a great many years, 25 perhaps, I gave chloroform in all operations, and in a great many obstetrical cases; also in a great many cases in the late unpleasantness in which you and I, Mr. Chairman, I believe, were engaged; I however, was on the oposite side.

DR. WILSON.—I would be glad to have you state that fact emphatically, Doctor, that we were on opposite sides.—(Laughter.)

DR. COLLINS.—I will say this, that among other things in which you had the advantage of us, you had ether to administer to your wounded soldiers, while we had nothing but chloroform; and during the four years that I was surgeon in the Confederate army, I gave chloroform as my duties demanded, and I never saw death caused directly, or indirectly from the anesthetic. Lately, I have not been so certain in its use. I had a few years ago a case that taught me caution in the use of this anesthetic. I gave a patient chloroform and she came near dying, and since then I have been an advocate of ether. But there is one fact that I want to bring out, and that is the preparation of the patient. Of course all surgeons who have the good of their patients on their mind will see that they do not have their stomachs overcrowded with food, for the reasons stated by Dr

Wilson and others; but there is a preparation common in the hospitals here and among the profession, and that is, that the patient has a more or less large dose of alcoholic stimulants combined with nux vomica,and as he suggested a few moments ago, an admixture of alcohol and ether, only increases the effect of the ether, and besides that, we know that alcohol is not a stimulant, it depresses the circulation.

Another point I would like to bring out is this, that a solution of camphor in oil is much better than alcohol and nux vomica. One is a heart stimulant and the other is a respiratory stimulant. The respiratory organs are rapidly involved immediately after the anesthesia, consequently, if we would use more of the camphorated mixture, we would have less of heart depression in chloroform anesthesia.

Dr. Whitney. From a pretty general reading of the foreign journals, I have come to believe that the use of chloroform is being rapidly done away with across the ocean. I know that a number of German surgeons are using ether instead of chloroform.

Dr. H. A. Lemen. I think it is exceedingly important and I never fail, to properly prepare my patient for an anesthetic. I aim to operate in the forenoon, and in the morning I have the patient take no solid food, and but little liquid, and then they are rarely troubled with nausea after the administration of ether.

I have never been surprised at the different statements made in regard to these anesthetics. The last and most reliable statement I believe is; One death in 10,000 from chloroform, and one death in 25,000 from ether, and one death in 75,000 from nitrous oxide. I believe no reference has been made in using chloroform in high altitudes. It is based to great extent on the question whether or not the heart is more easily exhausted in high than low altitudes. I believe that physicians in high altitudes should on general principles prefer ether. I believe the higher the altitude the more dangerous is chloroform.

I am a firm believer in pushing your operation, not hurrying, but getting through with it as soon as possible. I believe one of the objections to ether is the damaging effect it has on the structure of the kidneys. I never administer an anesthetic

of any kind without examining the urine chemically and microscopically when possible, and also examining the heart.

DR. DAVIS, (of McCook, Neb.).—I am not wedded to chloroform or ether. I use chloroform four or five times where I use ether once; but I want to notice the point made by Dr. Eskridge regarding mental shock. There is no doubt in my mind that the death which comes as the result of ether is often due to mental shock. The heart is feeble as the result of fright and it becomes necessary to stimulate a good deal in order to prepare the patient for the anesthetic.

To show the feeling which they used to have in Germany in regard to the use of chloroform I would like to speak of a little anecdote told by Dr. Henry B. Sands before his class in New York. He was in one of the hospitals in Hamburg, I believe, where they were giving chloroform right along, and one of the surgeous asked him if he would not administer ether for the next patient as he had never seen it given. Dr. Sands sent out for some ether and proceeded to administer it, thinking he would teach the German surgeons something—and the patient died.

In regard to giving an anesthetic, I think we are very prone to look upon it as something any one can do and for this reason turn it over to some not over bright assistant; on the same principle that when a boy is not good for anything else, he will do for a preacher. It has been the custom in private practice when one has two or three assistants, to assign places about as follows: "Dr. A. will act as first assistant, Dr. B. will be the second assistant, and Dr. C. is not of much account anyway, we will ask him to anesthetize."

Lately, I have heard a custom has come in vogue in London of having a professional anesthetizer, who does nothing but give anesthetics. If certain men in every district would study the subject more carefully and be ready at all times to answer calls, in a short time, it would become the custom to employ only professional anesthetizers and fewer deaths would result.

As far as the relative merits are concerned, we find a great many more deaths reported from chloroform than from ether;

but it seems to me, that if there were any way of ascertaining how many deaths occur from nephritis and bronchitis caused from ether, that the mortality list in the ether column would be just as voluminous as that ascribed to chloroform. Chloroform's victims have a tragical taking off, while the deaths caused by ether can be attributed to shock, to exhaustion and to a variety of other causes.

DR. SEARS.—It had not been my intention to take any part in this discussion, because I think the question has been fully discussed in all its detail. But Dr. H. A. Lemen just now spoke of the effect of chloroform, or the relative effect rather of chloroform and ether at high altitudes.

During the past twelve years, my residence has been at an altitude of something over 10,000 feet. It has been a continuous residence, and during that time, I have given anesthetics several hundred times personally, and have been present at many operations where anesthetics were given. I remember as long ago as 1881, that upon one occasion in the office of a brother practitioner, we gave a patient something more than a quarter of a pound of sulphuric ether without producing anesthesia; it was then suggested that we substitute chloroform for the ether The question arose immediately as to the probable danger of doing anything of the kind, but after considering the question, we made up our minds that we would go on, and almost immediately, produced complete surgical anesthesia with something less than a drachm of chloroform. Since that time, I have never used ether in the production of anesthesia, and I do not know of a single practitioner in the city of Leadville who now uses it as a means of producing anesthesia.

During my residence in Leadville, I have known of but one death from anesthesia, and that happened about two years ago in the person of a chronic alcoholic who had suffered from delirium tremens. In one other case, there was some danger of suffocation from great concentration of the chloroform vapor. Aside from these cases, I have known no danger or untoward result in the administration of the drug at a high elevation.

The whole question however, seems to be a matter of personal experience. The weight of opinion seems to be in

favor of ether, and I have no doubt that at lower altitudes than the one of which I speak, it is perhaps the safer of the anesthetics. At the altitude of which I am speaking, through long experience of the medical men residing there, we have adopted a means of giving chloroform, which is not generally practiced at a lower altitude I believe. We do not give it with a cone and sponge, we simply take a towel and place it over the face of the patient holding it at an elevation of perhaps an inch from the end of the nose, and with an ordinary dropper, from a two or three ounce bottle, allow the chloroform to drop gradually so that the atmosphere which the patient breaths will be largely diluted with atmospheric air. I think, indeed I know that we could not get along with ether at this high altitude of which I am speaking. At the altitude of Denver with proper restrictions and care, I believe that chloroform is as safe an anesthetic as is ether.

I desire to say that in the article, "On the Use of Anesthetics in Labor" to be found in Volume 1, of "The American System of Obstetrics," there is there recorded, at least two deaths from the use of chlorororm during labor, and a number of other cases in which very alarming symptoms were produced. Dr. W. K. Harrison, of Chicago, Illinois, suffered the loss of a woman in labor, after the administration of a few drops of chloroform. This happened in 1881. Another case was reported by Dr. R. G. Curtin to the Obstetrical Society of Philadelphia, and can be found in detail in the American Journal of Obstetrics, Vol. XII., p. 391. The statement that there have been no deaths from chloroform whatever during labor, will therefore, need revision.

I prefer chloroform as an anesthetic, I presume, because I have had a large experience in its use. There can never be absolute safety in giving any anesthetic, but with proper precaution and method in giving chloroform I believe it to be ordinarily safe. The whole question however, seems to be largely one of preference, which is the result of personal experience.

Dr. Hall.—I shall have to differ from one of the speakers as to the use of apparatus in anesthesia. Like him I learned

the use of ether in the institution where it was first administered, being taught by the son of that surgeon who had done more to advocate the use of ether than any one else, Dr. H. J. Bigelow.

My reason for advocating the use of apparatus in the administration of ether is, that I know perfectly well, from the use of Clover's etherizer in several hundred cases, that ether can be administered much more rapidly than with a sponge. Dr. Bigelow taught that the time for giving ether should be 15 to 20 minutes. In the institution in Boston, of which I have spoken, it was customary for the assistant to give the ether, and I have there, as well as in the city hospital, spent, at times, the whole forenoon in its administration. As soon as one operation was completed, the etherizer started with another patient. In this way, if the operation was delayed, the next patient was kept under the anesthetic for quite a while before this operation was begun. Much of this delay might have been avoided if some apparatus were used, by which anesthesia could have been induced in a few minutes, for then it would not have always been necessary to start one patient until the other was about ready to leave the operating theatre. Many operations may have been entirely finished in less time than was allowed for the ether, as, for instance, the reduction of fractures, etc. Thus on one occasion, when there was no dentist within 100 miles, I remember the people in the house timed me to see how long it took to give the ether and extract 25 teeth. The time was 17 minutes from the time the first breath was drawn. I feel perfectly sure that in many instances I have completed short operations in less than 20 minutes from the beginning of the ether.

Regarding the use of chloric ether, bi-chloride of methyline, pental and other anesthetics, I think most surgeons have given up the idea of using any of them, in-as-much as they have all proven more dangerous than chloroform, without any corresponding advantages. I am very glad to be corrected as to the deaths from chloroform during labor; but these deaths have been exceedingly rare.

One of the speakers mentioned an excellent point, and one which should be more thoroughly insisted upon, that the patient

should be examined to see that the heart is sound before the use of anesthetics. We should always remove artificial teeth. When about to anesthetize a girl of six years some time ago, I said in a laughing way: "Well, young lady, you are too young to have artificial teeth, arn't you?" Nevertheless, she showed symptoms of having something in the larynx during the operation, and turned quite blue. I turned her over and found that she had a very large piece of gum in her mouth which had caused the trouble.

I agree with Dr. Wilson that a good deal of trouble results from giving the anesthetic in a sitting posture, as so many dentists ask us to do. I will state that when I practised where there were no dentists I extracted from one to twenty-five teeth on a good many occasions, and always in a recumbent posture. I see no reason why it cannot be done in this way as well as in any other, if the dentist will only be careful to have a good light thrown into the mouth.

REPORT OF FOUR HUNDRED AND SIXTX-SIX CASES OF INTUBATION OF THE LARYNX.

By F. E. Waxham, M.D., Denver.

It has been my experience to have operated upon a large number of cases of diphtheritic laryngitis, and in presenting this report it is with the thought that accumulated experience will prove conclusively the value of the operation. These cases have not been selected, but were operated upon as they came, without reference to age, malignancy or unfavorable surroundings. The ages have ranged from five months to sixty years, and a very great majority have been among the poor and destitute, where proper care and nursing have been impossible.

These cases have been as follows:

FIRST ONE HUNDRED CASES.

AGE	NO. CASES.	RECOVERIES.	PER CENTAGE.
Under 1 year	5	1	20.00
1 year	13	2	15.38
2 "	22	4	18.18
3 "	17	2	17.76
4 "	15	7	46.66
5 "	9	3	33.33
6 "	5	2	40.00
7 "	8	2	25.00
8 "	4	3	75.00
9 "	1	1	100.00
10 "	1	0	00.00
	100	27	27.00

SECOND ONE HUNDRED CASES.

AGE.	NO. CASES.	RECOVERIES.	PER CENTAGE.
1 year	17	5	29.41
2 years	15	2	13.33
3 "	14	4	28.56
4 "	22	7	31.81
5 "	9	6	66.66
6 "	8	3	37.50
7 "	6	4	66.66
8 "	1	1	100.00
9 "	3	2	66.60
10 "	1	0	00.00
12 "	2	0	00.00
13 "	0	0	00.00
14 "	0	0	00.00
	100	44	44.00

THIRD ONE HUNDRED CASES.

Under 1 year	5	2	40.00
1 year	11	2	18.18
2 years	13	5	38.46
3 "	19	11	57.72
4 "	22	9	40.90
5 "	10	5	50.00
6 "	7	1	14.28
7 "	6	3	50,00
8 "	2	0	00
9 "	2	0	00
10 "	1	1	100,00
20 "	1	0	00
43 "	1	1	100.00
	100	40	40.00

FOURTH ONE HUNDRED CASES.

Uuder 1 year,	2	1	50.00
1 year	11	3	27.27
2 years	20	7	35,00
3 "	19	10	52.63
4 "	20	7	35.00
5 "	11	4	36.36
6 "	5	1	20.00
7 "	5	1	20.00
8 "	3	2	66.66
10 "	2	1	50.00
11 "	1	1	100.00
60 "	1	0	00
	100	38	38.00

LAST SIXTY-SIX CASES.

AGE.	NO. CASES.	RECOVERIES.	PER CENTAGE.
Under 1 year	1	0	00
1 year	10	1	10.00
2 "	I1	7	63.64
3 "	16	5	31.25
4 "	11	5	45.45
5 "	4	1	25.00
6 "	1	0	00
7 "	4	0	00
8 "	3	2	66.66
9 "	1	0	00
10 "	2	1	50.00
12 "	1	0	00
36 "	1	0	00
	66	22	33.33

TOTAL CASES.

Under 1 year.....	13	4	30.76
1 "	62	13	20.96
2 "	8I	25	30.86
3 "	85	32	37.64
4 "	90	35	38.88
5 "	43	19	44.18
6 "	26	7	26.92
7 "	29	10	33.33
8 "	13	8	61.53
9 "	7	3	42.85
10 "	7	3	42.85
11 "	1	1	100.00
12 "	3	0	00
13 "	1	0	00
14 "	1	0	00
20 "	1	0	00
36 "	1	0	00
43 "	1	1	100.00
60 "	1	0	00
	466	161	34.54

In order to make this record complete and to substantiate the statements made, I desire to give the age, date and name of the attending physician in each case.

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1885					
1	2 ys 1 m	Apr. 19	In my own practice...	Fatal....	Extension of membrane to bronchi.	24 hrs.	Mild.....
2	3 years	Apr. 23	In my own practice...	"	Extension of membrane to bronchi.	30 hrs.	"
3	16 mos	July 16	Drs. Hatfield & Casselberry	"	Extension of mem. and exhaustion	24 hrs.	Severe...
4	5 years	Sept. 15	Dr. Behrend	Recovery	.....	6 days	Mild.....
5	2 ys 7 m	Sept. 24	Dr. Richardson.....	Fatal....	Pneumonia.....	6 days	Severe...
6	20 mos	Nov. 3	Drs. Appleby & Dahlberg	Recovery	.....	4 days	Mild.....
7	4 years	Nov, 9	Drs. Bosworth & Nelson	Fatal...	Exhaustion	48 hrs.	Malign't
8	3 years	Nov. 16	Dr. Kossakosski.....	"	Extension of membr..	30 hrs.	Mild.....
9	2 ys 2 m	Nov. 13	" "	Recovery	.....	14 days	" .....
10	5 years	Nov. 20	Drs. Hatfield & Casselberry	Fatal....	Pneumonia.....	50 hrs.	" .....
11	5 years	Nov. 21	Dr. Valin.....	Recovery	.....	5 days	" .....
12	5 years	Dec. 2	Drs. Caldwell and Ogden	"	.....	4 days	Sev., fol. measles
13	3 years	Nov. 30	Dr. Holroyd.....	Fatal....	Extension of membrane to bronchi.	36 hrs.	Severe...
14	4 years	Dec. 3	Dr. Dahlberg	Recovery	.....	4 days	Mild.....
15	4 years	Dec. 9	In my own practice...	"	.....	3 days	" .....
16	3 years	Dec. 11 1886	Dr. Pierpont of Englewood	Fatal....	Pneumonia.....	48 hrs.	Severe...
17	4 ys 9 m	Jan. 4	Drs. Quine & Willard.	Recovery	.....	3 days	Absent...
18	3 years	Jan. 9	Dr. Miller of Kensington	Fatal	Exhaustion	24 hrs.	Severe...
19	2 years	Jan. 12	Dr. C. E. Caldwell....	"	Extension of membrane to bronchi.	24 hrs.	" ...
20	4 years	Jan. 13	" " "	"	Pneumonia.....	36 hrs.	" ...
21	7 years	Jan. 22	" " "	"	Extension of membrane to bronchi.	48 hrs.	" ...
22	5 years	Jan. 25	Dr. Dahlberg.....	"	Exhaustion	48 hrs.	Mild.....
23	2 ys 2 m	Jan. 26	Dr. Dyas	"	Diphtherit. toxæmia .	24 hrs.	Malign't
24	14 mos	Jan. 28	Dr. Berry.....	"	Pneumonia.....	48 hrs.	Severe...
25	11 mos	Jan. 28	Dr. C. E. Caldwell...	"	Exhaustion	24 hrs.	.....
26	13 mos	Feb. 6	In my own practice...	"	"	24 hrs.	Severe...
27	4 years	Mar. 1	Dr. Steele.....	"	Pneumonia.....	48 hrs.	" ...
28	7 years	Mar. 5	Dr. McGinnis of Brighton	"	Extension to bronchi.	60 hrs.	" ...
29	2 years	Mar. 6	Dr. Hoadley	Recovery	.....	7 days	Mild.....
30	8 years	Mar. 8	Drs. Kippax & Adams	Fatal....	Extension to bronchi.	48 hrs.	Severe...
31	2 years	Mar. 9	Dr. R. L. Rea.....	"	" "	24 hrs.	" ...
32	2 years	Mar. 11	Dr. Rehrend	"	Pneumonia.....	48 hrs.	" ...
33	9 mos	Mar. 13	In my own practice...	"	Exhaustion.....	72 hrs.	" ...
34	17 mos	Mar. 15	Dr. Wm. E. Hall.....	"	"	24 hrs.	" ...
35	7 years	Mar. 25	Dr. Van Doozer.....	"	Suffocation from detachment of membrane after removal of tube.	24 hrs.	Mild.....
36	3 years	Mar. 27	Dr. C. E. Caldwell....	"	Extension of membrane to bronchi.	36 hrs.	Severe...
37	7 years	Mar. 29	Dr. McWilliams	Recovery	.....	86 hrs.	Mild.....
38	7 years	Mar. 31	Dr. Parsons.....	Fatal....	Extension of membrane to bronchi.	72 hrs.	" .....
39	2 years	Apr. 25	Drs. Fenger & Storck.	"	Extension to bronchi.	48 hrs.	" .....
40	7 years	Apr. 28	Dr. Lawless.....	"	Suffocation after ejection of tube.	24 hrs.	" .....
41	8 years	Apr. 29	Dr. Tillotson.....	Recovery	.....	2 days	Severe...
42	3 years	May 3	Dr. Berry	Fatal....	Pneumonia.....	48 hrs.	" ...
43	14 mos	May 5	Drs. Steele & Lawless	Recovery	.....	86 hrs.	" ...
44	2 years	May 6	Dr. Clendenning.....	Fatal....	Extension to bronchi.	72 hrs.	" ...
45	3 years	May 10	Dr. D. Collins.....	Recovery	.....	5 days	" fol. scar. fev.
46	3 years	May 16	Dr. Tillotson.....	"	.....	6 days	Mild.....

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1866					
47	14 mos	May 20	Dr. Tillotson	Fatal	Uremic cogvulsions	48 hrs.	Severe
48	.....	May 22	Drs. Johnson and Mannheimer	"	Heart failure	24 hrs.	"
49	5 years	May 26	Dr. McDonald	"	Diphtherit. toxæmia	3 days	"
50	3 yeass	May 27	Drs. Johnson and Mannheimer	"	Exhaustion	12 hrs.	"
51	7 years	June 5	Drs. J. H. Hollister & Goodall	"	Heart failure	16 hrs.	"
52	2 years	June 9	Dr. Clendenning	"	Exhaustion	12 days	Mild
53	4 years	June 9	Drs. Bogue and Shepherd	Recovery	.....	4 days	Severe
54	10 mos	June 11	Dr. Burbank	Fatal	Exhaustion	24 hrs.	"
55	8 years	July 14	Dr. Thomas	Recovery	.....	4 days	Mild
56	9 mos	July 28	Dr. J. V. Bacon	Fatal	Exhaustion	24 hrs.	Severe
57	5 years	Aug. 16	In my own practice	"	Extension to bronchi.	5 days	"
58	9 years	Aug. 13	Dr. McDavitt of Winona, Minn.	Recovery	.....	12 hrs.	Absent
59	9 mos	Sept. 2	Dr. Bates	"	.....	4 days	Well mar
60	4 years	Sept. 12	Dr. Sternagie	Fatal	Extension to bronchi.	3 "	" "
61	4 years	Sept. 27	Dr. Steele	Recovery	.....	4 "	" "
62	23 mos	Sept. 29	" "	Fatal	Extension to bronchi.	2 "	" "
63	8 years	Sept. 30	In my own practice	Recovery	.....	3 "	" "
64	4 years	Oct. 4	Dr. Tallman, So. Englewood	Fatal	Pneumonia	3 "	" "
65	2½ yrs	Oct. 7	In my own practice	"	Extension of membr.	3 "	" "
66	2 years	Oct. 10	Drs. Emrick and Dal.	Recovery	.....	4 "	" "
67	3 years	Oct. 13	Dr. Barlow	Fatal	Extension to bronchi.	8 hrs.	Severe
68	2 y 10 m	Oct. 18	Dr. J. G. Berry	Recovery	.....	4 days	Well mar
69	7 years	Oct. 20	Dr. Tallman	Fatal	Pneumonia	4 days	" "
70	3 years	Oct. 21	.....	"	Extension to bronchi.	24 hrs.	" "
71	2 y 10 m	Oct. 21	Drs. Steele & Riley	"	Convulsions	24 "	" "
72	2 ys 3 m	Oct. 31	Dr. Berry	"	Extension to bronchi.	36 "	" "
73	3 years	Nov. 6	Drs. Oliver and Kaufman	"	Pneumonia	36 "	" "
74	13 mos	Nov. 11	Dr. C. W. Earle	"	Exhaustion	12 "	Severe
75	10 yrs	Nov. 13	Drs. Webb & Lackner	"	Heart failure	24 "	"
76	3 years	Nov. 13	Dr. Behrend	"	Broncho-pneumonia	3 days	"
77	6 years	Nov. 17	Dr. Lackner	"	Extension of membrane to bronchi.	2 "	"
78	6 years	Nov. 19	Dr. Roy of Auburn	"	Extension of membrane to bronchi.	2 "	"
79	4 years	Nov. 24	Drs. Bates and Mulfinger	Recovery	.....	3 "	Well mar
80	3 years	Nov. 29	Dr. Abel	Fatal	Extension to bronchi.	2 "	Severe
81	18 mos	Dec. 1	Dr. Barlow	"	" " "	24 hrs.	"
82	6 years	Dec. 1	Dr. Bert	"	Exhaustion	24 "	Malign't
83	4 years	Dec. 2	.....	"	Broncho-pneumonia	2 days	Severe
84	4 years	Dec. 9	Dr. C. E. Caldwell	"	Pneumonia	2 "	"
85	2½ yrs	Dec. 20	Dr. J. G. Berry	"	Extension of membr.	2 "	"
86	4 years	Dec. 22	Dr. Larkin, S. Chicago	"	" " "	2 "	"
87	4 years	Dec. 29	Dr. J. G. Berry	Recovery	.....	7 *Hour**	Well mar
		1887					
88	6 years	Jan. 2	Dr. Banga	"	.....	4 days	" "
89	2 years	Jan. 17	In my own practice	Fatal	Extension to bronchi.	24 hrs.	Severe
90	7 years	Jan. 20	Dr. Burr	Recovery	.....	3 days	Well mar
91	18 mos	Jan. 20	Dr. J. Berry	Fatal	Extension to bronchi.	2 "	Severe
92	2 years	Jan. 27	.....	"	Extension of membr.	3 "	"
93	6 years	Feb. 4	Drs. Mitchell & Gatchell	Recovery	.....	3 "	Absent
94	2 years	Feb. 7	Dr. Quine	Fatal	Broncho-pneumonia	26 hrs.	Severe
95	4 years	Feb. 22	Dr. McDonald	"	Diphtherit. toxæmia	4 days	"
96	5 years	Feb. 25	Dr. Murdock	Recovery	.....	4 "	"
97	2 years	Feb. 26	Dr. McDonald	Fatal	Exhaustion	24 hrs.	"
98	2 years	Mar. 1	.....	"	Extension of membr.	2 days	"
99	2½ yrs	Mar. 19	Dr. Burry	"	" " "	2 "	"

*Patient ejected the tube with a piece of membrane, which did not re-form, and recovery quickly followed.

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1887					
100	3 years	Apr. 13	.....	Fatal....	Extension of membr..	2 days	Severe...
101	12 yrs	Apr. 19	Dr. Leavitt	"	Diphtherit. toxæmia .	3 "	Very sev.
102	3 years	Apr. 30	In my own practice...	"	Extension of membr..	2 "	Severe...
103	3 years	May 10	Dr. Kauffman of Blue Island	"	" " " ..	3 "	" ...
104	4 years	May 11	In my own practice...	"	" " " ..	3 "	" ...
105	3 years	May 24	Dr. Bert.....	"	" " " ..	3 "	" ...
106	9 years	June 7	Dr. Leavitt	Recovery	.....	4 "	" ...
107	4 years	June 21	Dr. Marr.....	Fatal....	Exhaustion	4 "	" ...
108	14 yrs	June 21	Dr. Keeler	"	"	20 hrs.	Very sev.
109	18 mos	July 14	Dr. E. M. Hale.....	Recovery	.....	4 days	Severe...
110	4 years	July 14	Dr. DeWolf of Eugle-wood	Fatal....	Extension of membr..	2 "	" ...
111	18 mos	July 31	.....	"	" " " ..	2 "	" ...
112	6 years	Aug. 8	Dr. Le Barier.....	"	Bronchial invasion...	12 hrs.	" ...
113	2 years	Aug. 11	Dr. Steurnagle.....	"	Exhaustion	24 "	" ...
114	5 years	Aug. 13	Dr. Kewley.....	"	Bronchial invasion...	2 days	" ...
115	3 years	Aug. 22	Dr. Price.....	Recovery	.....	4 "	Very sev.
116	2 years	Sept. 14	Dr. Burr.....	Fatal....	Extension of membr..	2 "	Severe...
117	4 years	Sept. 16	Dr. Kossakosski.....	"	Detachment of memb.	2 "	" ...
118	22 mos	Sept. 24	Drs. Jacobs & Steele..	Recovery	.....	6 "	Mild.....
119	4 years	Sept. 21	Dr. J. G. Berry.....	"	.....	3 "	Absent...
120	6 years	Sept. 25	Dr. Smith.....	Fatal....	Exhaustion	4 "	Very sev.
121	4 years	Oct. 2	Dr. Holman.....	Recovery	.....	3 "	Severe...
122	22 mos	Oct. 5	" "	Fatal....	Extension of membr..	3 "	" ...
123	9 years	Oct. 7	Dr. Dyas.....	Recovery	.....	5 "	" ...
124	5 years	Oct. 10	Dr. McCarthy.....	"	.....	4 "	Absent...
125	7 years	Oct. 21	" "	Fatal....	Exhaustion	36 hrs.	Very sev.
126	6½ yrs	Oct. 21	Dr. Cook.....	"	Detachment of membrane below tube...	6 "	Absent...
127	6½ yrs	Oct. 23	Dr. J. G. Berry.....	"	Exhaustion	4 days	Mild.....
128	4 years	Oct. 25	.....	"	Extension of membr..	3 "	Severe...
129	4½ yrs	Nov. 2	Dr. Casely.....	"	Exhaustion	3 "	Very sev.
130	3 years	Nov. 7	Dr. Nelson	Recovery	.....	6 "	Mild.....
131	2 years	Nov. 24	Dr. Church	Fatal....	Extension of membr..	36 hrs.	Severe...
132	1 year	Nov. 24	Dr. Dahlburg.....	"	Bronchial invasion...	6 days	Well mar
133	4 years	Dec. 4	Drs. Saunders and Mannheimer	Recovery	.....	3 "	" "
134	2½ yrs	Dec. 7	Drs. Steele and Babcock	Fatal....	Extension of membr..	2 "	Severe...
135	13 yrs	Dec. 8	Dr. Merkle.....	"	Diphtherit. toxæmia.	2 "	Very sev.
136	9 years	Dec. 23	Dr. Riley.....	"	" " .	2 "	Malign't
137	3 years	Dec. 26	Dr. Thomas.....	"	Extension of membr..	2 "	Severe...
138	3 years	Dec. 27	Drs. Gatchell & Mitchell	"	" " " ..	3 "	Mild.....
139	2 years	Dec. 28	Dr. Gfroere	"	Capillory bronchitis..	24 hrs.	Well mar
140	10 yrs	Dec. 31	Dr. Skyles.....	"	Diphtherit. toxæmia .	24 "	Malign't
		1888					
141	3 years	Jan. 1	Dr. Jacques.....	"	Extension of membr..	3 days	Well mar
142	6 years	Jan. 3	Dr. Boas.....	"	Exhaustion	3 "	Malign't
143	3 years	Jan. 28	Dr. Dietrich	Recovery	.....	3 "	Well mar pertussis
144	4 years	Feb. 9	Dr. Quine	Fatal....	Uræmia.....	3 "	Sev., fol. scarlatin
145	4 years	Feb. 16	Dr. Parsons.....	Fatal....	Exhaustion	36 hrs.	Malign't
146	2 years	Feb. 17	Dr. Roberts, Lemont.	Recovery	.....	3 days	Absent...
147	5 years	Feb. 19	Dr. Kauffman.....	Fatal....	Extension of membr..	3 "	Well mar
148	18 mos	Feb. 27	Drs. Rea & Roler	"	Obstruction below tube	3 "	" "
149	5 years	Mar. 2	Dr. B. D. Foster.....	Recovery	.....	6 "	Severe...
150	2 years	Mar. 5	Whitman & Holman..	Fatal....	Extension of membr..	24 hrs.	" ...
151	18 mos	Mar. 30	Dr. Steele.....	"	Extension to bronchi.	26 "	" ...
152	4½ yrs	Mar. 31	Dr. Scudder.....	"	Detachment of memb.	2 days	" ...
153	2½ yrs	Mar. 31	Dr. Colwell	"	Extension to bronchi.	2 "	Very sev.

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheretic Symp'ms
		1888					
154	2½ yrs.	Apr. 5	Dr. C. C. Sperry.....	Fatai....	Extension to bronchi.	2 days	Severe...
155	18 mos.	" 13	" Abel.....	"	" " "	36 hrs.	" ...
156	5½ yrs.	" 13	" B. D. Foster.....	Recovery	.....	6 days	Very sev.
157	18 mos.	" 14	" Guerin and Quine	Fatal....	Detachment of memb.	12 hrs.	Severe...
158	15 mos.	" 19	" E. E. Babcock....	"	Extension to bronchi.	2 days	" ...
159	3 years	May 13	" Harris.....	Recovery	.....	3 "	Well mar
160	5 years	June 2	" C. E. Caldwell....	"	.....	4 "	Severe...
161	18 mos.	Oct. 15	" Murdoch.....	"	.....	4 "	Well mar
162	4 years	" 18	" Simons.....	"	.....	4 "	Severe...
163	4 years	" 25	In my own practice...	Fatal....	Extension to bronchi.	3 "	Well mar
164	6 years	" 28	Dr. Jacobs.....	Recovery	.....	3 "	" "
165	6 years	Nov. 1	In my own practice...	"	.....	2 "	Severe...
166	2 years	" 4	" " " ...	Fatal....	Sudden suffocation after ejection of tube	2 "	" ...
167	3 years	" 12	Dr. E. E. Babcock....	"	Extension of membr..	3 "	" ...
168	1 year	" 13	" Burr.....	"	Obstruct'n bel'w tube	1 "	" ...
169	4 years	" 14	" Beery.....	Recovery	.....	4 "	" ...
170	7 years	" 15	" Tillotson.....	Fatal....	Exhaustion.....	2 "	Malign't
171	1 year	" 25	" Stout.....	" ...	Extension to bronchi.	2 "	Severe...
172	7 years	" 27	" O'Malley.....	Recovery	.....	4 "	Semi-malignant
173	18 mos.	" 30	" Jacques & Steele..	"	.....	2 "	Mild.....
174	7 years	Dec. 2	" C. E. Caldwell....	"	.....	5 "	Severe...
175	4 years	" 3	" G. W. Webster....	"	.....	5 "	Semi-malignant
176	4 years	" 11	" Jacobs.....	Fatal....	Extension to bronchi.	6 "	Severe...
177	4 years	" 16	" Giljohann.....	Recovery	.....	4 "	" ...
178	12 yrs.	" 20	" Rockwell and Gee	Fatal....	Detachment of membrane below tube	2 "	" ...
179	4 years	" 25	" Miller.....	"	Exhaustion.....	7 "	Very sev.
180	4 years	" 25	" Banga and Broell.	"	Detachment of membrane below tube	24 hrs.	Severe...
		1889					
181	8 years	Jan. 1	" Jacques.....	Recovery	.....	4 days	" ...
182	6 years	" 2	" Church.....	"	.....	4 "	" ...
183	18 mos.	" 5	" A. L. Thomas.....	Fatal....	Extension of membr..	2 "	" ...
184	17 mos.	" 10	" Parsons.....	"	Exhaustion.....	12 hrs.	Malign't
185	2½ yrs.	" 14	" Harry L. Thomas	" ...	Extension of membr..	24 "	Severe...
186	15 mos.	" 18	" Miller.....	Recovery	.....	3 days	" ...
187	5 years	" 24	" Barrows.....	"	.....	4 "	" ...
188	2½ yrs.	" 27	" Whidden.....	"	.....	4 "	" ...
189	3½ yrs.	Feb. 17	" Giljohann.....	Fatal....	Extension of membr..	3 "	" ...
190	4 years	" 19	" Abel.....	"	Exhaustion.....	4 "	" ...
191	7 years	Mar. 11	" Kippax.....	Recovery	.....	12 hrs.	" ...
192	5 years	" 14	" Simons.....	Fatal....	Exhaustion.....	24 "	Malign't
193	3 years	" 18	" Beery.....	Recovery	.....	3 days	Severe...
194	7 years	" 19	Drs. Steele and Babcock	"	.....	2 "	" ...
195	2 years	" 25	Dr. Steele.....	Fatal....	Exhaustion.....	5 "	" ...
196	4 years	" 26	" Jacobs.....	"	Extension of membr..	3 "	" ...
197	6 mos.	Apr. 2	" Whitman.....	"	" " " ..	24 hrs.	" ...
198	8 years	" 8	Drs. Mitchell and Gatchell	"	Exhaustion.....	24 "	Malign't
199	4 years	" 10	Dr. Stowell.....	"	Extension of membr..	2 days	Severe...
200	4 years	" 14	" Hall.....	"	" " " ..	7 "	" ...
201	4 years	" 16	" Jacobs.....	"	Detachment of memb.	4 "	" ...
202	2½ yrs.	" 20	" Streeter.....	"	Extension of membr..	2 "	" ...
203	4 years	" 29	" "	"	Exhaustion.....	3 "	Semi-malignant
204	3 years	May 1	" Merowitz.....	Recovery	.....	3 "	Severe...
205	4 years	" 6	" C. E. Caldwell....	"	.....	3 "	" ...
206	3½ yrs.	" 14	" Kewley.....	Fatal....	Detachment of memb.	24 hrs.	" ...
207	3 years	" 27	Drs. Nelson and Bosworth	Recovery	.....	4 days	" ...
208	2½ yrs.	" 28	Dr. Stroe.....	Fatal....	Extension of membr..	24 hrs.	" ...
209	4 years	June 1	" McArthur.....	Recovery	.....	5 days	" ...

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheretic Symp'ms
		1889					
210	5 years	June 9	Dr. Steele	Fatal	Measles	2 days	Severe
211	4 years	" 10	" Brill	Recovery		9 "	"
212	5 years	" 15	" Brinkerhoff	"		5 "	"
213	4 years	" 20	" Winrow	Fatal	Extension of membr.	4 "	"
214	17 mos.	July 31	" Brill	Recovery		5 "	"
215	18 mos.	Aug. 2	" Mercer	Fatal	Extension of membr.	2 "	"
216	4 years	" 16	" Rutherford	"	Exhaustion	9 "	"
217	8 years	" 21	" Eskridge	"	"	36 hrs.	Malign't
218	3 years	Sept. 2	" Rutherford	"	Extension of membr.	36 "	Severe
219	3 years	" 18	" J. G. Berry	Recovery		4 days	"
220	4 years	Oct. 4	" Willard	Fatal	Detachment of memb.	3 "	"
221	18 mos.	" 4	" Pynchon	"	Exhaustion	36 hrs.	"
222	2½ yrs.	" 6	In my own practice	Recovery		5 days	Mild
223	5 years	" 7	Dr. Whitman	Fatal	Extension of membr.	3 "	Severe
224	5 years	" 9	Drs. Sullivan & Berry.	Recevery		5 "	Well mar
225	2½ yrs.	" 9	Dr. Egan	Fatal	Extension of membr.	2 "	Severe
226	4 years	" 10	" Case	Recovery		6 "	"
227	3 years	" 12	" E. R. Bennett	"		3 "	"
228	18 mos.	" 14	" Hall	Fatal	Extension of membr.	2 "	"
229	9 mos.	" 18	" Rutherford	Recovery		4 "	"
230	3 yrs.	" 21	" E. R. Bennett	Fatal	Unknown	24 hrs.	"
231	9 years	" 27	" Gee	"	Extension of membr.	2 days	"
232	3 years	" 30	Drs. Bosworth and Creighton	"	" " "	2 "	"
233	3½ yrs.	Nov. 3	Dr. J. Bell	Recovery		4 "	"
234	5 years	" 5	" C. C. Davis	Fatal	Extension of membr.	2 "	"
235	6½ yrs.	" 5	" Whitnall	"	" " "	4 "	"
236	3 years	" 8	" Leavett	"	Detachment of memb.	2 "	"
237	7 years	" 10	" Goodall	"	Extension of membr.	2 "	"
238	4 years	" 13	" J. G. Berry	"	" " "	2 "	"
239	4 years	" 14	" McGaughey	"	" " "	2 "	"
240	5 years	" 19	" Harris	"	Pneumonia	36 hrs.	"
241	13 mos.	" 20	" Roberts, Lemont.	"	Extension of membr.	36 "	"
242	3 years	" 28	In my own practice	Recovery		8 days	"
243	3 years	Dec. 3	Dr. Creighton	"		4 "	"
244	5 years	" 4	" Greenfield, W. C. Caldwell	"		9 "	"
245	2½ yrs.	" 11	Dr. Champlin	Fatal	Extension of membr.	36 hrs.	"
246	2 years	" 30	" Butler	"	" " "	2 days	"
247	10 yrs.	" 30	" Waldemeyer	Recovery		4 "	"
		1890					
248	4 years	Jan. 5	" Wing	Fatal	Exhaustion	36 hrs.	"
249	3 years	" 6	" Taylor	"	Extension of membr.	36 "	"
250	4 years	" 6	" Dahlburg	"	" " "	48 "	"
251	9 years	" 16	" Daugherty	"	Pneumonia	3 days	"
252	4 years	" 16	" Harris	Recovery		4 "	"
253	6 years	" 26	" R. G. Collins	Fatal	Uræmic convulsions	3 "	Very sev.
254	6 years	" 27	" A. S. Thomas	"	Gangrene of foot	7 "	Malign't
255	4 years	" 30	" Bacon, Englewood	"	Exhaustion	2 "	Very severe
256	4 years	" 30	" Greenfield	"	Unknown	2 "	Severe
257	15 mos.	Feb. 2	" Volini	Recovery		4 "	Well mar
258	3 years	" 8	" Steele	"		5 "	Very sev.
259	6 years	" 11	Drs. Bates & Church	"		4 "	" "
260	2 years	" 20	Dr. Riley	Fatal	Exhaustion	2 "	" "
261	4 years	" 21	" Byrne	Recovery		7 "	Severe
262	7 years	" 21	" Flood	"		4 "	"
263	18 mos.	" 24	" Quine	Fatal	Extension of membr.	24 hrs.	Very sev.
264	6 years	" 25	" Flood	"	" " "	3 days	Severe
265	7 years	" 25	Drs. Earle and Herrick	Recovery		21 "	Well marked
266	3 years	Mar. 1	Dr. P. S. Hayes	"		6 "	Severe
267	11 mos.	" 6	" C. E. Caldwell	Fatal	Extension of membr.	48 hrs.	"
268	15 mos.	" 6		"	" " "	48 "	"
269	3 years	" 15	Dr. Simons	"	Detachment of memb.	12 "	"
270	3 years	Mar. 16	" Parsons	"	Extension of membr.	4 days	"

Case	Age	Date	In Consultation with—	Termination	Cause of Death	Tube Worn	Diphtheretic Symp'ms
		1890					
271	3 years	Mar. 18	Dr. Earle	Recovery		3 wks.	Well mar
272	2 years	" 19	" WcWilliams	"		5 gays	Severe...
273	5 years	" 27	Drs. Shepherd and Jones	"		4 "	" ...
274	7 years	Apr. 2	Dr. Banga	"		4 "	Well mar
275	20 yrs.	" 7	" Rockwell	Fatal	Exhaustion	36 hrs.	Malign't
276	2½ yrs.	" 10	" Froom	Recovery		3 days	Well mar
277	7 years	" 11	" Kewley	Fatal	Extension of membr.	24 hrs.	Malign't
278	10 mos.	" 13	" Casely	Recovery		2 days	Well mar
279	4 years	" 15	" Coy	"		5 "	Severe...
280	1 year	" 18	" Creighton	Fatal	Exhaustion	2 "	" ...
281	5 mos.	" 22	Drs. Earle and Herrick	"	"	10 hrs.	Well marked
282	4 years	" 28	Dr. James Bell	"	Extension of membr.	2 days	Severe...
283	2 years	" 29	Drs. Earle and Fitch	Recovery		5 "	Very sev.
284	5 years	May 1	Dr. Fitzpatrick	Fatal	Detachment of memb.	12 hrs.	Severe...
285	5 years	" 3	" Schmidt	Recovery		2 wks.	" ...
286	1 year	" 6	" J. Frank	Fatal	Extension of membr.	24 hrs.	" ...
287	6 years	" 10	" Reynolds	"	" " "	2 days	Sev. nas'l pharyngl & laryng.
288	4 years	June 6	" Weidner	Recovery		4 days	Severe...
289	6 years	" 8	" Streeter	Fatal	Exhaustion	12 hrs	Malign't
290	18 mos.	" 23	" Quine	"	Extension of membr.	48 "	Severe...
291	7 years	July 19	" Fenn	"	Bronchial obstruction	36 "	" ...
292	2½ yrs.	" 20	" Morgan	"	Exhaustion	36 "	Very sev.
293	3 years	Aug. 4	" Frankenthal	Recovery		4 days	Well mar
294	2 years	" 18	" Rutherford	"		5 "	Severe...
295	43 mos.	" 29	" Herrick	"		7 "	Well mar
296	19 mos.	Sept. 20	In my own practice	Fatal	Extension of membr.	2 "	" "
297	4 years	" 22	Dr. Caldwell	"	" " "	2 "	Severe...
298	8 years	Oct. 29	" Casely	Recovery		6 "	" ...
299	7 years	" 30	" Armstrong	Fatal	Extension of membra. after tracheotomy	2 "	" ...
300	20 mos.	Nov. 11	" Merowitz	Recovery		7 "	Well mar
301	4½ yrs.	" 14	" Stanton	"		8 "	Severe...
302	14 mos.	" 16	" Earle	"		5 "	" ...
303	3 years	" 18	" Harris	Fatal	Extension of membr.	36 hrs.	" ...
304	4 years	" 27		"	Exhaustion	4 days	" ...
305	5½ yrs.	" 28	Dr. Hayes	"	Extension of membr.	5 "	" ...
306	3 years	Dec. 8	" Maschek	"	" " "	2 "	" ...
307	3½ yrs.	" 12	" Murdock	"	" " "	2 "	" ...
308	2½ yrs.	" 24	" "	"	" " "	2 "	Well mar
309	18 mos.	" 26	" Shepherd	"	" " "	2 "	Severe...
310	3½ yrs.	" 29	" Merowitz	Recovery		4 "	Well mar
311	3½ yrs.	" 30	" Sullivan	Fatal	Extension of membr.	5 "	Very sev.
		1891					
312	19 mos.	Jan. 6	" Goodner	"	" " "	2 "	" "
313	5 years	" 7	" Lawlers	"	Exhaustion	9 "	" "
314	2½ yrs.	" 15	" Huffaker	Recovery		3 "	Well mar
315	4 years	" 18	Drs. Houston & Campbell, Joliet	"		9 "	Severe...
316	5 years	" 21	Dr. Kauffman, Blue Island	Fatal	Extension of membr.	5 "	" ...
317	5½ yrs.	" 25	Dr. C. E. Caldwell	"	" " "	3 "	" ...
318	2 years	" 25	" Coy	"	" " "	24 hrs.	" ...
319	3½ yrs.	Feb. 2	" Rittenhouse	"	" " "	2 days	" ...
32	2½ yrs.	" 13	" Matter	"	" " "	36 hrs.	" ...
321	2½ yrs.	" 13	" Merowitz	Recovery		3 days	Well mar
322	4 years	" 15	" Collins	Fatal	Extension of membr.	7 "	Severe...
323	10 yrs.	" 16	" R. G. Collins	"	" " "	2 "	" ...
324	4 years	" 17	" Isham	"	Exhaustion	6 hrs.	Malign't
325	2 years	" 17	" Kauffman of Blue Island	"	Extension of membr.	3 days	Severe...
326	10 yrs.	" 17	Dr. C. W. Earle	Recovery		3 "	Well mar
327	10 yrs.	" 12	" Alderson	"		4 "	Severe...

Case	Age	Date	In Consultation with—	Result	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1892					
328	4 years	Feb. 24	Dr. Dahlberg	Recovery		4 days	Severe...
329	2½ yrs.	Mar. 7	Drs. Wilder & Philips	Fatal	Extension of membr.	3 "	" ...
330	4 years	" 7	Dr. Fuller	Recovery		5 "	" ...
331	4 years	" 16	" Brill	Fatal	Extension of membr.	2 "	" ...
332	18 mos.	" 25	" E. E. Babcock	"	" " "	3 "	" ...
533	5½ yrs.	April 8	" Miller	Recovery		7 "	
334	4½ yrs.	" 12	" Huffaker	Fatal		9 "	Paralysis 2 wks aft. removal of tube
335	60 yrs.	" 15	" Palmer, Morris, Ill.	Fatal	Pneumonia,		Died 3 dy aft. rem. of tube
336	7 years	" 23		Fatal	Extension of membr.	3 days	Severe...
337	2 "	May 13	Dr. E. E. Babcock	"	" " "	2 "	" ...
338	2 "	" 15	" Brill	Recovery		10 "	" ...
339	3 "	" 27	" E. E. Babcock	"		4 "	" ...
340	18 mos.	June 18	" Oliveri	"		10 "	" ...
341	2 years	July 6	" Casely	Fatal	Extension of membr.	3 "	" ...
342	9 mos.	Aug. 25	" C. E. Caldwell	"	" " "	24 hrs.	Very sev.
343	2 years	Sept. 14	" Merkle	Recovery		9 days	Well mar
344	3 "	" 23	" Able	Fatal	Extension of membr.	2 "	Very sev.
345	3 "	" 29	" Bradley	Recovery		5 "	" "
346	4 "	Oct. 6	" Berry	Fatal	Extension of membr.	24 hrs.	Severe...
347	15 mos.	" 12	" Bradley	"	" " "	24 "	Well mar
348	2 years	" 15	" Eiss & Nelson	"	Exhaustion	8 "	Malign't
349	4 "	" 18	" Mercer	Recovery		11 dys.	Severe...
350	3 "	" 18	" Moore	"		6 days	Well mar
351	5 "	" 29	Own practice	"		7 "	Severe...
352	5 "	" 26	Dr. McDonald	Fatal	Extension of membr.	24 hrs.	Very sev.
353	5 "	" 27	Own practice	Recovery		7 days	Severe...
354	6 "	" 29	Dr. Miller, Kensingt'n	"		5 "	" ...
355	6 "	" 29		Fatal	Extension of membr.	6 "	" ...
356	8 "	" 30	Dr. Eiss	"	Exhaustion	7 "	Very sev.
357	2½ "	" 31	" Calvert	Recovery		6 "	" "
358	8 mos.	" 31	" Coe	"		24 hrs.	Mild.....
359	3 years	Nov. 1	" Berry,	"		24 "	Mild.....
360	11 "	" 5	" Bradley	"		5 days	Severe...
361	6 "	" 5	" Weidner, Dalton	Fatal	Broncho-pneumonia	24 hrs.	Well mar
362	3 "	" 12	" C. S. Hatfield	Recovery		4 days	Well mar
363	2 "	Dec. 9	" Hall	Fatal	Extension of membr.	2 "	Very sev.
364	1½ "	" 22	" Mercer	"	Broncho-pneumonia	24 hrs.	Very sev.
365	4 "	" 26	" Rockwell	"	Extension of membr.	24 "	Very sev.
366	5 "	" 28	" Gary	"	Broncho-pneumonia	3 days	Severe...
		1892					
367	2 "	Jan. 1	" Hipp	Recovery		5 "	Very sev.
368	7 "	" 2	" Rockwell	Fatal	Extension of membr.	2 "	Severe...
369	7 "	" 2	Own practice	"	Exhaustion	5 "	Very sev.
370	4 "	" 2	Dr. Thomas	Recovery		5 "	Very sev.
371	1 "	" 5	" Hipp	Fatal	Extension of membr.	2 "	Severe...
372	3½ "	" 4	" Hancock	Recovery		6 "	Very sev.
373	6 "	" 5	" ....., Roseland	Fatal	Exhaustion	6 "	Very sev.
374	3 "	" 13	" Buchanan	Recovery		6 "	Well mar
375	2 "	" 18	" Volini	Fatal	Extension of membr.	3 "	Severe...
376	2½ "	" 19	" Dahl	Recovery		5 "	" ...
377	3½ "	" 22	" Froom	Fatal	Extension of membr.	2 "	" ...
378	7½ yrs.	" 30	" Berry	Recovery		4 "	" ...
379	18 mos.	Feb. 8	Own practice	Fatal	Broncho-pneumonia	3 wks.	Very sev.
380	4 years	" 11	Dr. Burwash	"	Extension of membr.	2 days	Severe...
381	4 "	" 13	" Cook	Recovery		5 "	" ...
382	4 "	" 19	" Cullen	Fatal	Broncho-pneumonia	2 "	" ...
383	4 "	" 24	" Collins	"	Extension of membr.	3 "	Well mar
384	2 "	Mar. 4	" Hall	"	" " "	26 hrs.	Severe...
385	2 "	" 5	" Boyce	"	Exhaustion	24 "	" ...
386	4 "	" 15	" Eskridge	"	Extension of membr.	4 days	" ...
387	5 "	" 21	" Oliveri	"	Exhaustion	36 hrs.	" ...

Case	Age	Date	In Consultation with—	Result	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1892					
388	2 years	April 1	Dr. Froom	Fatal	Extension of membr.	3 days	Severe
389	3 "	" 5	" Creighton	"	" " "	2 "	"
390	3 "	" 8	" Miller, Kensingt'n	"	" " "	3 "	Well mar
391	5 "	" 11	" Van Doozer	Recovery		7 "	Very sev.
392	3 "	" 11	" Schottenfels	"		4 "	Severe
393	3 "	" 19	" Harsha	"		5 "	Very sev.
394	4 "	" 26	" Ward	Fatal	Extension of membr.	3 "	Severe
395	5 "	" 27	" Bacon, Englewood	"	" " "	2 "	Severe
396	6 "	" 27	Dr. Williams	"	" " "	3 "	Severe
397	4 "	May 1	" Fruit	"	" " "	2 "	Semi-malignant
398	5 "	" 2	" Corbos	"	Exhaustion	2 "	Malign't
399	3 "	" 6	" E. E. Babcock	Recovery		5 "	Well mar
400	14 mos.	" 7	" Carter, Waukegan	Fatal	Broncho-pneumonia	24 hrs.	Very sev.
401	1 year	" 9	" Bates	"	Exhaustion	6 "	Moribu'd
402	22 mos.	" 10	" Stanton	"	Extension of membr.	2 days	Severe
403	14 mos.	" 11	" Brill	"	" " "	2 "	Severe
404	3 years	June 13		"	Exhaustion	2 "	Malign't
405	3 "	" 20	Dr. McGowan	Recovery		6 "	Severe
406	18 mos.	" 24	" Hall	Fatal	Extension of membr.	36 hrs.	Severe
407	3 years	Aug. 3	Own practice	Recovery		8 days	Very sev.
408	4 "	Sept. 12	Dr. Webb	Fatal	Exhaustion	7 "	Semi-malignant
409	2 "	" 16		Recovery		7 "	Very sev.
410	2½ "	Oct. 1	Dr. Giljohann	"		6 "	Milh
411	3 "	" 7	" Abel	Fatal	Pneumonia	24 hrs.	Moribu'd
412	2 "	" 10	" Chew	"	Extension of membr.	24 "	Semi-malignant
413	1 year	" 12	" Christie	"	Extension of membr.	24 "	Severe
414	14 mos.	" 13	" Huffaker	"	Capillory bronchitis	2 wks.	Mild
415	2½ yrs.	" 14		"	Extension of membr.	24 hrs.	Severe
416	4 years	" 17	Dr. McGowan	"	Extension of membr.	3 days	Very sev.
417	2½ "	" 18	" Willard	Recovery		10 "	Sev. with measles
418	4 "	" 18	" Christie	Fatal	Extension of membr.	3 "	Severe
419	4 "	" 19	Drs. Garceau&Walling	Recovery		8 "	Mild
420	18 mos.	" 28	Dr. Van Doozer	Fatal	Extension of membr.	24 hrs.	Severe
421	4 years	" 31	Drs. Clark and Phelps Elgin	Recovery		4 days	Mild
422	3 "	Nov. 5	Dr. McDonald	"		7 "	Severe
423	6 "	" 18	" Chancellor	Fatal	Extension of membr.	5 "	Severe
424	3 "	" 23	" Phillips	Recovery		6 "	Well mar
425	8 "	" 24	" Reese	"		8 "	Severe
426	2½ "	" 25	" Thomas	"		5 "	Severe
427	2½ "	" 25	" Klominski	"		5 "	Severe
428	20 mos.	" 26	" Huffaker	"		5 "	Well mar
429	5 years	" 27	" Burkey	"		10 "	Severe
430	14 mos.	" 28	" Berry	Fatal	Extension of membr.	24 hrs.	Severe
431	4 years	Dec. 5	" Owens	"	Detachment of memb.	12 "	Severe
432	3 "	" 8	Own practice	Recovery		6 days	Severe
433	7 "	" 6	Dr. Rankin, Pullman.	Fatal	Extension of membr.	2 "	Severe
434	3 "	" 7	" Steele	"	Extension of membr.	4 "	Severe
435	3 "	" 5	Own practice	Recovery		6 "	Severe
436	1 "	" 7	Dr. Brooks	Fatal	Extension of membr.	2 "	Well mar
437	14 mos.	" 10	" Levy	"	Exhaustion	24 hrs.	Malign't
438	8 years	" 10	" Whittaker	"	Extension of membr.	24 "	Severe
439	3 "	" 12	" Hilton	"	Exhaustion	24 "	Malign't
440	4 "	" 12	" Evans	"	Extension of membr.	4 days	Severe
		1893					
441	20 mos.	Jan. 21	" Bradley	"	Extension of membr.	24 hrs.	Severe
442	3 years	" 25		Recovery		8 days	Severe
443	5 "	" 30	Dr. Earle	Fatal	Convulsions	4 hrs.	Sev. with measles
444	3 "	Feb. 3	" Ward	"	Extension of membr.	48 hrs.	Severe

Case	Age	Date	In Consultation with—	Result	Cause of Death	Tube Worn	Diphtheritic Symp'ms
		1893					
445	10 yrs.	Feb. 8	Dr. Garceau	Recovery		5 days	Well mar
446	8 years	" 8	" Bradley	"		5 "	Severe...
447	3 "	" 17	" "	Fatal	Extension of membr.	48 hrs.	Severe...
448	4 "	" 24	" Parsons	Recovery		5 days	Severe...
449	10 "	" 26	" Walling	Fatal	Exhaustion	24 hrs.	Malign't
450	3 "	Mar. 3	" Creighton	Recovery		24 "	Severe...
451	3 "	" 11	" Gaffney	Fatal	Extension of membr.	48 "	Severe...
452	2 "	" 13	" Hammond	Recovery		4 days	Severe...
453	7 "	" 23	" Cartwright	Fatal	Extension of membr.	48 hrs.	Severe...
454	2½ "	" 30	" Bradley	"	" "	36 "	Well mar.
455	36 "	Apr. 24	" Oliveri	"	" "	3 days	Well mar
456	4 "	" 24	" Mattison	Recovery		6 "	Severe...
457	4 "	" 25	" Ogden	"		9 "	Well mar
458	2 "	May 11		Fatal	Extension of membr.	2 "	Severe...
459	2 "	" 12	Dr. Burr,	"	" "	5 "	Severe...
460	3 "	" 12	" Whitford	"	" "	2 "	Severe...
461	15 mos.	" 15	" Creighten	"	" "	36 hrs.	Severe...
462	3 years	" 16		"	" "	3 days	Well mar
463	4 "	" 17	Dr. Berry	"	" "	4 "	Well mar
464	2 "	" 17	" Thomas	"	" "	3 "	Well mar
465	2 "	" 28	" Stroe	"	" "	24 hrs.	Very sev.
466	5 "	" 1	" Fitzpatrick	"	Detachment of memb.	12 "	.....

Erroneous impressions are often entertained in regard to the operation of intubation. It is often believed and asserted that the operation is done early, but this is a great mistake. In my hands it is only done as a last resort, and often after the patient has become moribund and unconscious; not unfrequently a patient has been found dead upon arrival. As will be observed by the record of cases, nearly all have been in consultation with other physicians, and it would have been impossible to have operated early, even had there been a desire to have done so. Again it is often believed that the operation is not suitable to those cases where membrane has already invaded the trachea, on account of the danger of forcing membrane down in advance of the tube, or on account of the danger of detachment of membrane below the tube. This indeed is an always present danger, but one that can usually be overcome by watchful care. In introducing the tube if membrane is forced down in advance of it all that is necessary is to quickly withdraw it by drawing up on the thread that is still attached to the tube. The expulsive cough which follows will expel the offending membrane.

Should membrane become detached below the tube there will always be indications of the impending danger, and usually hours before it occurs. When these indications are present, as is evident by the frequent, hoarse, squeaking or partially

obstructed cough, the tube should at once be removed, when the expulsive cough following will detach and expel the membrane. In this manner it has been my good fortune to have secured many membranous casts of the trachea, and even of the larger bronchial tubes, of which these specimens are a few examples.

The citation of a few cases in this connection may not be uninteresting or uninstructive.

Case 181.—This patient was not only greatly exhausted from the disease, but by previous attempts at intubation which had been unsuccessful. Upon arriving the patient was found unconscious, pulseless at the wrist and upon the very verge of suffocation. A tube was quickly introduced and artificial respiration performed. The child soon revived and made a complete and perfect recovery after having worn the tube four days.

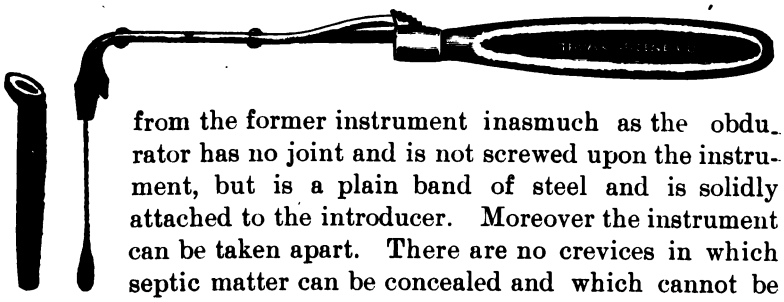
Case 226.—Upon arriving I was informed by the attending physician that it was too late, the boy was dying. The sphincters had relaxed, the eyes were rolled upward, he was livid, unconscious and pulseless, and within five minutes would undoubtedly have been dead. With the remark that we would give him a chance for life, a tube was quickly introduced and artificial respiration performed. He fully revived and wore the tube three days, when it was expelled. The dyspnœa returned and it became necessary to réintroduce it. After four days it was again removed and he made a perfect recovery.

Case 252.—In this case the pharyngeal symptoms were mild, no membrane being visible in the pharynx, but the child was dying of suffocation due to laryngeal obstruction. The tube was introduced, giving him prompt relief. Two days later it became evident that membrane was present below the tube, and when it was removed a partial cast of the trachea was expelled. As respiration was still greatly impeded the tube was reintroduced. Two days after this it again became evident that there was partially detached membrane below the tube. It was also evident that membrane had extended into the smaller bronchi. The tube was removed and this membraneous cast was expelled, which you will observe is a cast of the whole trachea and the two larger bronchial tubes. The patient was

now able to breathe comfortably though rapidly, and made a perfect recovery.

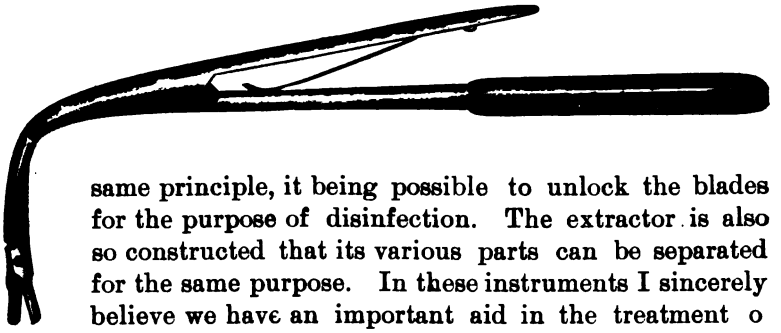
In this connection I take pleasure in exhibiting an improved set of instruments. The thought that led to these improvements was that we were not meeting the demands of antiseptic surgery with the former intubation instruments, for it was not possible to render them aseptic. Through the assistance and cooperation of Chas. Truax-Greene & Company, of Chicago, to whom I am under great obligation, I am enabled to present these instruments, which I hope will meet your approval.

The case you will observe is a metallic one, instead of being velvet lined, which renders it possible to subject it to boiling, steaming or washing with antiseptics. The introducer differs



from the former instrument inasmuch as the obdurator has no joint and is not screwed upon the instrument, but is a plain band of steel and is solidly attached to the introducer. Moreover the instrument can be taken apart. There are no crevices in which septic matter can be concealed and which cannot be

reached by antiseptic solutions. The gag is made upon the



same principle, it being possible to unlock the blades for the purpose of disinfection. The extractor is also so constructed that its various parts can be separated for the same purpose. In these instruments I sincerely believe we have an important aid in the treatment o one of the most fatal and dreaded diseases of early life.

INDICATIONS FOR THE USE OF THE UTERINE CURETTE.

By W. W. Grant, M.D., Denver.

Some familiarity with the periodical literature of the day with my own observation, forces the thought as to the application and actual necessity, as well as the value, of the uterine curette. Even now the question is forced, the inquiry suggested, not alone as to the special condition requiring its use, but rather how the uterus is to escape it—what are the contra-indications. It is now becoming fashiona ble to do it. Every novitiate will urge it without much discrimination, and men of experience will be tempted to join the crusade.

We are destined to witness a repetition in this field of the laparotamy epidemic for removal of the appendages, sometimes needlessly, but happily in this instance with fewer disastrous consequences to the present or future of the patient, though this operation is not free of danger. From my own observation and experience I will briefly present some of the special indications for its use and the place it should occupy as a therapeutic

or operative measure in gynecological practice. In a new field of work it is especially never wise to neglect those prudential considerations taught alone well by observation and experience, and which is never inconsistent with the most aggressive action and radical surgery when the occasion demands. As to antiseptics, I have always regarded that as the best surgery which gave the patient the benefit of any doubt that might be entertained as to its utility and propriety in any case. The method as utilized in my own practice I will give somewhat in detail:

First. The patient is required to take a bath and wash the vulva and irrigate the vagina with a sublmate solution—1 to 2,000. She is usually, but not invariably, given an anesthetic, ether being preferred. She is placed either on the back or side, Clover's crutch and rubber cushion being excellent adjuvants. The perineum is retracted with a short single blade speculum. The uterus is pulled down near the vulvar orifice with double hook, Skenes being one of the best. The dilator, not advised or used by some, is now inserted and the cervical canal well opened. I now insert the tubular curette, usually a dull one, which is attached to a bag filled with warm sublimate lotion 1 to 2 or 3,000. The whole internal surface of the uterus is scraped rapidly and vigorously, the antiseptic liquid flowing steadily at the same time and washing out also the debris as fast as detached by the instrument. The sharp curette is used, if satisfied all disease tissue is not removed without it. The uterus is now wiped out with absorbent cotton and iodine and carbolic acid applied. The irrigator is reinserted to wash out excess of medicines and coagulated material. The uterus is again wiped out with cotton and the cavity filled moderately with iodoform gauze which protrudes into the vagina, for the purpose of drainage and to stimulate absorption and promote involution. This is permitted to remain from two to three days. The whole procedure when skillfully done requires ten or fifteen minutes. And if thoroughly done it is not necessary to repeat it, though it may be necessary to reapply medicine and gauze once or twice a month. The diseased condition most frequently and urgently demanding this treatment is corporeal and cervical endometritis, subacute and chronic. Chronic en-

dometritis of the corpus seldom exists without inflammation of the cervical canal. The latter more frequently exists uncomplicated. Corporeal endometritis is frequently associated with metritis and retroflexion and version. The latter if not caused by the metritis will induce metritis and hypertrophy of the fundus by constriction of the nerves and blood vessels, thus interfering seriously with a free natural circulation. In the polypoid or fungus endometritis there is not only thickening of the membrane but a proliferation of tissue in and beneath. The little excrescence, resembling papillæ are new formations called granulations. The surface becomes uneven from the swelling and hyperplasia. These little formations are sensitive and bleed upon the touch of a probe or other slight provocation. It is in just such cases of body and cervix that the treatment I have described is particularly a specific, prompt and efficient action. In cases with septic origin there is not infrequently some chronic inflammation of the broad ligaments but this is no contraindication to the treatment. In fact the patient will be benefitted often by it. I do not advise this treatment in acute cases unless the puerperal septic condition. It is perhaps needless to urge at this day that in cases of persistent flowing or other evidence of retained matter after abortion the operation is required and will give prompt relief. In catarrhal salpingitis it may be of some service if followed by drainage but can do no permanent good in pyosalpinx which will only be cured by removal of the appendages.

There is a condition of the uterus preceding the menopause that is not uncommon and is very distressing and enervating, many women having to remain in bed a good part of the time for months and years. They are suffering from endometritis and metritis, menorrhagia and metrorrhagia and the consequent nervous disturbance depriving them of comfort, strength and happiness. Too frequently the family physician says: "It is the change of life, wait and be patient." It will stop before long. These patients will be cured by the treatment in question. The condition has aggravated all the unpleasant accompaniments of the latter days of menstruation, and without a doubt prolongs needlessly its final cessation. I will introduce two instances:

Mrs. M., age 46, suffered greatly for years with back ache, irregular and excessive flowing, common symptoms of endometritis, though some patients do not flow as much as usual. The uterus measured four inches by the probe and the body was much enlarged. Cervical metritis also existed. One year ago this patient was curetted and iodine and carbolic acid applied a few times. She ceased to menstruate in two months, and has been well ever since in every particular. Mrs. W., age 49, presented much the same history, only suffering more from innutrition. She was treated in the same way. Next menstruation was still profuse and lasted as usual seven days. She was again subjected to the operation. Next menstruation was a manifest improvement and it was the last. This patient still lives here and has no pelvic trouble of any kind, health being good. Women over 40 often suffer in this way from the excessive loss of blood and the train of symptoms familiar to us, loosing strength, vigor and spirit. In addition to other symptoms patients with endometritis are sometimes annoyed with persistent tympanitis the same as during menstruation. Mrs. H., age 33, was troubled in this way, but regarded it as due to pregnancy. Been married ten years and had one child. She was a very active and industrious woman and notwithstanding she flowed a little two or three times a month, she engaged a physician to attend her at labor. I was called in consultation, he doubting her pregnancy, though not having examined her. On examination I found her suffering from endometritis: curetted and treated, as I have described, but once, December 10th, 1892. She has been perfectly regular ever since, all bloating ceased and she was perfectly well in two or three months. Mrs. C., age 35, is a case of more than ordinary interest. June 8th, 1892, at St Luke's hospital I removed the ovaries and tubes for hæmatoma of ovaries and salpinx in which condition she had suffered over two years. The cysts undoubtedly ruptured at menstrual periods and producing repeated attacks of pelvic peritonitis. She recovered promptly from the operation was dismissed on the eighth day when I removed the stitches. I examined the uterus at the time of the operation and its size and position were normal. I told her menstration would cease en-

tirely in all probability, in two or three months. She returned to Iowa and Kansas City. In two months wrote me that she had menstruated very freely, and with very brief intervals continued to flow. So she returned on April 1st. Examination showed uterus larger than at the operation, but freely movable, with no disease, pain or inconvenience at site of former trouble and had suffered no pain or pelvic inflammation. I urged immediate curetting. This was done thoroughly; the intra-uterine gauze was not removed until end of third day. There was not an unpleasant symptom in any respect. She has not flowed a particle since. The marked anæmia, insomnia, extreme nervousness and weakness has disappeared rapidly and she feels now like a new woman. Whether there existed a hemorrhagic diathesis, or there was any relation between the condition of the ovaries, tubes or uterus, I am not prepared to answer; but though such a history after the former operation is unusual, I am rather disposed to regard the association a coincidence only.

Mrs. R. age 43, widow, with two children nearly grown, operated on four years ago for laceration of cervix, very fair union, but never satisfactory as she has suffered ever since, for 2 years having most intense dysmenorrhea attended with vomiting and headache. There was profuse mucopurulent discharge. She was suffering from chronic corporeal and cervical endometritis and there was a small polypus in cervix. Position of uterus very good. No disease of tubes or ovaries. This was a typical case of the fungous or polypoid inflammation affecting body as well as mucous membrane of cervix. She was given ether, the polypus removed with scissors and the entire cavity curretted, cauterized with iodine and creasote and gauze drain inserted. This was done February 18th, 1892; patient has been so well as to need no attention since. The influence of cervical laceration in arresting involution and causing endometritis with uterine hyperplasia is well known. Neither can such a condition be easily cured or satisfactorily treated without its repair.

Mrs. F., age 28, married, had one child three years ago. Examination revealed severe double laceration of cervix though on one side, rupture of perineum though not extreme; and cysto-vaginocele. The uterus was prolapsed. For the cystocele

the ordinary operation of colporrhaphy even as modified by Sims, has not been satisfactory. So in this complicated case I thoroughly curretted and irrigated the uterus. The rents in cervix being on same side and near each other. I took out a V shaped piece and sewed up with silk-worm gut. The perineum was repaired at once by the Tait double flap operation, extending the dissection of each labium to a point opposite the mouth of urethra, hoping thereby to more certainly prevent protrusion of bladder and anterior vaginal wall. The patient progressed most satisfactorily. Union was perfect in both places, and on the 17th day after the operation I introduced pessary to more perfectly support the uterus and anterior vaginal wall. This operation was done on January 14th, 1892. She went to California soon after and when I heard from her last in April she was well except from annoyance from cervical stitches which I supposed would be absorbed in much less time.

Mrs. K., age 27, never pregnant; suffered intolerably from menstrual pains, flow irregular and lasting five or six days, never profuse. Position of uterus good. Cervix slightly enlarged. Stenosis of external os. Endometrium of both cervix and body of uterus, very sensitive and bled when touched with probe. This case could not be treated with curette without previous dilatation of cervix. This was done March 20,'92, much fungous material was removed from the cavity and treated with usual application and drainage. Says now she was never so well and suffers no more from dysmenorrhea. I deem it unnecessary to adduce other records of cases. While it is true that most cases requiring this method of treatment of women are or have been married, yet endometritis in a severe and protracted form is not so uncommon amongst virgins and such cases require much the same treatment. Imprudence and utter disregard of health at menstruation is the usual beginning of such trouble with them. Interesting histories of such cases, with radical measures for relief might be given. The cases reported I trust indicate strikingly the use of the curette, and its very great value. I would emphasize the appropriate aids in connection with its application. The procedure described is a

great step forward, and will abide with us. From it I have not yet sustained a loss, nor an unpleasant sequel.

DISCUSSION.

DR. COLLINS. I have some hesitancy in getting up so promptly, as I would like to hear from others on the subject, but I do not want Dr. Grant's paper to pass without discussion. It is certainly a paper in the right direction, owing to the frequency of diseases of the Fallopian tubes, or the uterus itself. It is a conservative operation, and one in my opinion that will supersede the necessity of early or late cœliotomy for the removal of the appendages. Endometritis may commence as you know as a vaginitis, specific or otherwise. We have frequently an extension of the disease in the lumena of the Fallopian tubes attended by salpingitis and exudation.

If the condition of the cervical canal or the cavity of the uterus, was more frequently and carefully looked after than in the past, the necessity for the frequent removal of the appendages that has been so common in the past, and more or less common now, would not be present with us.

The operation is not only a conservative operation, but a scientific operation. You will find that mucous cavities in other localities may be benefited by a similar treatment with good results; the nasal and pharyngeal cavities as well, perhaps. We do not have the gauze drainage, but that may be an improvement in that direction.

The operation when properly undertaken, or undertaken in a proper condition of the pelvic organs, is to my mind devoid of danger. The bad results that have hitherto attended this operation have been on account of the fact that the pelvic organs were not prepared for the operation. The uterine appendages are frequently more or less involved in the inflammation. We have an inflammation of the tubes that is not attended with retention and collection of pyogenic products at all; we have no pus, in fact; at least if there is any it is mucopus, and not expected to be septic. I mention this to show that the conditions are not so serious as to demand cœliotomy.

A thorough divulsion of the uterine canal and a thorough

curettement of the cavity of the uterus, and a thorough packing of that cavity, will often drain the Fallopian tubes, particularly if the uterine ends of the tubes are open.

We may have a great many cases of congestion that are attended with a complete closure of the uterine end of the fallopian tube, and where the operation of curettement has been performed, it is followed by a complete relief of congestion. If the tubes are distended with pus and there are other symptoms of sepsis, no gynæcologist would hesitate to remove these organs. We cannot make a positive diagnosis of the pelvic organs of women in many instances. I have had some experience, and I honestly admit that a critical diagnosis is at times almost an impossibility.

In some cases now, if it seems that the uterus is more or less immovable, and the operator does not take the precaution of avoiding too much tension on the uterus, there may be rupture of the adhesions and peritonitis will ensue; but otherwise it is almost devoid of danger.

The practice of medicine is largely in the nature of what the English call "fads." If this is a fad, and I have no doubt it is, it is a fad superior to the one preceding it in the fact that it preserves important organs to women. The cœliotomist or the gynecologist may come before you and say that these organs are irretrievably destroyed and why not remove them? But we know if we are deprived of an important organ, it acts more or less upon the nervous system, and my observations are that cœliotomy has not in the main been as successful as we had hoped for. In other words, there are conditions left after the removal of the offending appendages, that are as serious to the woman as the one for which she has been operated on.

Dr. Grant's paper is in the line of conservatism, and he should be given the thanks of the society. I have had some experience, some 400 cases I believe, and it has only been within the last four or five years that we have brought the operation to the point of a scientific one. Eight or ten years ago we simply dilated the uterine cavity and expected the results to be favorable from dilatation. Now we curette the cavity because it will come in place again.

The Doctor mentioned the fact that a great many young women suffered from endometritis, not only suffered from this but from the extension of the disease into the tube, and more or less peritonitis is the result. Sooner or later these cases will come into the hands of the physician, and you will find that they are suffering from endosalpingitis. The operation that the Doctor details is a proper one for this complaint and will result in a complete cure if the patient is properly handled after the operation. I have known some cases that have been divulsed and curetted in the East, and a tube put in the cervical canal and worn for an indefinite period, the patient attending to her social and family duties. I consider this however, a most dangerous operation, and it should never be undertaken.

DR. WHITNEY. I had an opportunity in New York, to see Dr. Thomas do this operation, and one of the things which he did impressed itself on my mind. He curetted the uterus in a submerged condition, and recommended that it should be always done this way. In the Sim's position it is very easy to fill the vagina with anti-septic fluid. The uterus is not pulled down far, and he scrapes with the dull curette under water. It seems to me that this is a very safe method.

I want to relate a little incident which occurred in my experience which I think might be useful to others in relation to the use of the intra-uterine injection. I opened a retro-uterine haematocele posteriorily, put in a drainage tube, and for several days I inserted a nozzle daily, and irrigated the abcess. On the fourth day, this opening was very large, and I thought I could insert a nozzle without the guide of the finger. It seemed to go in quite easily. I used a simple fountain syringe, and generally let the water flow in for about five minutes. This time the woman exclaimed after a minute or so had elapsed that she had a very severe pain, I did not at first think it amounted to much, and continued for a few seconds to let the water run, when she began to give utterance to more forcible symptoms of pain, then I thought the water must be entering the abdominal cavity, and that the nozzle had passed into the uterus instead of the abcess. I removed the nozzle, the pain continued

to increase, and in a few minutes I felt certain that I had to deal with an incipient peritonitis. I went to my office as rapidly as possible, returned with morphia and began giving it to her in large quantities. She went through a regular peritonitis, it lasted four days, but had been localized by the hypodermics, and I am happy to say she recovered. That was a lesson to me to be extremely careful about injecting liquid into the uterine cavity.

Dr. Munn. I think the thanks of this society are especially due to Dr. Grant and to Dr. Collins, for their remarks in reference to the improper performance of the abdominal section and removal of the uterine appendages, when that operation might have been avoided by the curetting of the uterus.

The general practitioner sees far less of this class of cases than the gynecologist, and yet it has been my fortune to observe several cases, and I have had one in my own experience in which I am certain that had the uterus been thoroughly curetted, the oopherectomy would have been avoided. Oophorectomy is too frequently performed on account of slight cystic condition of the ovaries, or the presence of muco pus in the Fallopian tubes. These conditions rarely justify removal of the ovaries or the Fallopian tubes. I have seen cases where oophorectomy or salpingectomy was proposed, but the operation of curettement being first performed, the patient remained well for several years afterward.

The natural conclusion is that the symptomatology of salpingitis, ovaritis and endometritis is to a great extent the same, and that the surgeon who overlooks the possible existence of endometritis, and thinks that the symptoms must be due to the other conditions, is committing a grave error and may endanger the welfare of his patient.

I wish to report a case in line with that of Dr. Whitney. A patient after instrumental confinement and subsequent perineorraphy, was left under the charge of a nurse, supposed to be skilled in the use of the vaginal douche, which was ordered used at intervals. The perineorraphy was, I afterwards discovered, not a complete success, as the sutures cut through

the perineal body, and a sac filled with secretions and pus was formed posterior to the nicely co-apted skin perineum.

In giving a douche, the nurse passed the vaginal tube first into the contents of this pouch, and then pushed it into the uterus as far as possible. The injected fluid passed through the Fallopian tube and into the peritoneal cavity,causing a fatal peritonitis.

DR. GRANT.—I think my paper clearly outlined the kind of cases in which this operation is needed. If one reads the articles in the journals, it will be difficult to find a condition in which some one won't advocate the remedy. I have outlined cases in which my own positive experience has taught me to use it in gynecological practice, and I wish to lay particular stress on the matter of drainage which I think belongs to myself as much as to any one.

I currette no case without applying gauze; in that way we get rid of all the liquid effusion, and it is perfectly wonderful how rapidly the gauze promotes absorption and involution. It can be applied as I stated without the use of the curette at all.

As to the dilatation of the cervix there is a difference of opinion on that, so good a man as Skeene objecting to it.

I think the danger of injecting liquids into the uterus without dilatation of the cervix, should be plain to every one; when that is the case, we will not have the unfortunate consequences to which Dr. Whitney alluded. I wish to say in regard to this point, that I always dilate under antiseptic precautions; this I elaborated in my paper. The curette I use is generally a dull one. The dull curette will remove all the tissue it is desired to remove, and I am satisfied from the sense of touch and sound, when all tissue is removed. This proceedure is as perfect an antiseptic operation as it is possible to do. The instrument is attached to a water bag with warm water and the flow of water washes out tissue as fast as you detach it; after this, I wash it out, applying iodine and carbolic acid if the case is of long standing, and then I wash it again. This method I have pursued in my own practice without regard to authorities, and I have never seen anything to improve it. None of them advocate drainage; but I believe it

very essential in this operation. I will state frankly, that I have operated with it many times in very bad cases, and I have not had an unpleasant sequel from the operation. The patients did well, and the only result was a little tenderness and pain that we could expect. I keep them still for a week or ten days. The gauze can be removed without pain, and subsequently you can apply the iodine or creosote and the drainage, if you want to. In a great many cases we have retroflexion of the uterus, and the drainage aids to counteract that.

OUR SCHOOL GIRL.

By Laura L. Liebhardt, M. D. Denver.

The eminent scholar and philanthropist, Max von Pettikofer, who ranks among the highest authorities on all questions relating to public health, said: "Mere chance will not explain the fact that in the history of human civilization, it has always been unmistakably those nations that have shown the greatest care for the health of their citizens, that have exercised the most useful and powerful influence in the world.'

It is most assuredly an auspicious sign of our nineteenth century when our general public is awakening to such live questions as personal hygiene, reform in dress, physical exercise—in short, to the prevention of disease; this is an age of prophylaxis, and never before has the laity been so willingly active in combating the evil influences that menace our general health; never before has medical literature dwelt so extensively on the etiology of disease. It is notoriously true that very few of our profession have the time or inclination to visit public schools; it is likewise true that we have not often been consulted by either the school board or the pedagogue; but as so infinitely much depends upon the school-room, from which are to emanate our cabinet ministers and the future mothers of our promising republic, and as most of the unfavorable condi-

tions of school-life are so remediable, it becomes incumbent upon us as a progressive and capable body to consider seriously certain school problems. In individual capacities we are unable to effect marked reforms. It requires the united efforts of strong, public-spirited men and women to efface the beaten tracks of time.

We permit and encourage other countries to dictate to us the correct systems of gymnastics, and do not question their utility; we wait for Hungary to establish a precedent in electing a school physician and in rendering compulsory the establishment of a chair of hygiene in each university, while the Berlin M.D. must compile our school statistics. We are leading the world—or its equivalent, we *think* we are *leading*—in gynecology, but our medical societies rarely consider such practical questions as, for instance, "How can we abolish the gynecological chair?" or "How make the study of hygiene more profitable and more popular in our public schools and colleges?" The most complete development and performance of an organ results from the most intelligent and normal use of it, and from the presence of conditions essential to its nutrition; and individuals so constituted are among the most efficient men and women in every community. An acquaintance with the physiology and anatomy of the pelvic organs ought to be as widespread among our girls as any other branch of information, and in no other department of education is ignorance termed innocence. How discomfited the young woman becomes when embarrassed by a question relating to profane history or literature, but with what nonchalance she avers her ignorance of certain vital processes that dominate her entire being. But whither shall she turn to procure this desired information? "To her natural guardian, her mother," replies the uninformed public; not at all, say we, for the average mother is not armed with sufficient technical knowledge to do so efficiently, while to certain exceptionally capable ones the talk is as difficult as it is to talk religion to their sons; for she is more often repelled than encouraged.

The next recourse would naturally be a book, well-written and well-meaning; but aside from the extreme difficulty in pro-

curing such a prize, she does not apply herself assiduously to the task, usually skips one-half the pages, and furthermore has no one to consult. The only feasible and correct method in my opinion would be by means of a series of lectures or talks by trained men and women who have made such study a life work —physicians themselves. Upon inquiry I find that in no public school in the city is such a course in vogue, and the thought has repeatedly suggested itself, why not introduce this system into the High school, where girls from the eighth grade could also congregate, and the talks be enlivened by means of charts and specimens. The subject of reproduction should be touched upon, neither haltingly nor too explicity, but with infinite tact, just lucid enough to hold the attention of the sensitive schoolgirl; and especially should the study of the menstrual functions be made sufficiently instructive that she may become the true custodian of her own body. As an equivalent for the boy an equal number of lectures on biology and social purity, conducted by a competent man physician would adjust any ill-feeling. I am confident that such a course would cultivate a higher regard for their health and greatly enhance their future usefulness. A mother should be charged with criminal negligence who permits her daughter to reach the first menstrual crisis and not anticipate it with appropriate and kindly advice; for how frequently do we encounter evil results directly attributable to such gross neglect.

Tacitus tells us of the strong German race that lived contemporaneously with him, whose women were by no means inferior to the men either in strength or point of size. We have heard of the fame of the Amazons of Central Africa and of the burden bearer of the aborigines—the wife—who encountered every hardship unmurmuringly, and to whom local pelvic troubles were unknown; but neither man nor woman living would wantonly revert back to those primitive states of mind. We have paid the penalty for our present civilization, "we have lost our wild flower" and must now treat the house-plant as she appeals to us. Emerson says: "Society never advances; it recedes as fast on one side as it gains on the other," by

which he implies that a gain in culture is wrought at expense of the physical; this transition from one to the other should be so gradual that neither is sacrificed. A common error of the gynecologist is to veto certain social dissipations, very dear to the young patient; admonish her to certain exercise, to diet, to avoid unhygienic attire, in fact he acts the dictator in true Napoleonic style; whereas, if he would only specify as to the particular kind of exercises, of food, and point out the chief fallacies of to-day's dress, in short, give her lucid reasons for his objections, he would gain her cooperation and expedite her recovery. To lay down rigid rules for patients without giving valid reasons for the same is as impracticable as to require her to commit to memory a verse of the Aeneid and comprehend its text without first having made the acquaintance of the Latin fables; you might as well expect her to memorize an undemonstrated geometrical problem. But if you appeal to her judgment and enter into a cursory explanation, you will find her both tractable and reasonable.

I am frequently appalled at the gross ignorance manifested regarding our anatomy; I, myself, recall the hazy, chaotic impressions left me when I emerged from the high school. Nothing will so intimidate the average adult patient as to request him to make pressure over the liver in order to note tenderness; he invariably gives you an appealing look and says "which side?" and to the average person the abdominal aorta is no more sacred than the superfical palmar arch. From the wall in my private office is suspended a picture representing a scene in a darkened dissecting room, the ominous scattered articles and array of tables at once suggests to the practiced eye the details of an autopsy. Upon one of the tables rests the well rounded figure of a beautiful young girl, apparently asleep, so life-like is the representation that her looks do not betray her surroundings; beside her stands a venerable anatomist intently examining the heart which he has just removed from the lifeless body. Many have been the comments which this picture has evoked, but none startled me more thoroughly than those offered by a patient of mine, a so-called well-bred and well educated woman, in every way occupying the position of leader in

her especial sphere, when she said "pray, explain to me the the mysteries suggested by this picture; it always arouses my curiosity; do they really take out a heart like that and replace it again?" We have all heard of the eye that some one saw "removed and scraped" and replaced without any sacrifice of vision; and when we allow our risorius muscles to twitch suspiciously we forfeit a friend. We all have patients who ignore nature's laws to the extent of unheeding a constipation extending over a period of two weeks,and not long since an intelligent lady brought me eight ounces of urine as the entire twenty-four hours quantity, secure in the thought that her kidneys were acting properly. Doubtless my hearers could cite even more laughable mis-conceptions carefully cherished by an otherwise intelligent public. The common school curriculum embraces an infinitesimal amount of physiology and hygiene and yet the second year student in the classical course fluently translates "*mens sana in corpore sano.*" But a reaction is already upon us, due to the progressive spirit of the age; the training that our fathers received is no longer adequate to the needs of today. I took pains to investigate the amount of attention accorded this study in our local public schools and find that in none of our three high schools is physiology taught at all; neither in the eighth grade, with one exception. The rule is to finish this branch with the seventh grade, where it is taught daily for six months by charts and specimens,according to the individual tastes of the teacher; the text book adhered to is from the able pen of Dr. H. Newell Martin, Prof. of Biology in Johns Hopkin's University. The lower grades use the elementary book, styled "Temperance Physiology; or, The Path-finder."

A contribution to the "American System of Obstetrics and Gynecology," from the able pen of Prof.Gill Wylie, contains the following words which I copied verbatim and which I frequently heard in substance from his own lips. He says: "It is a well recognized fact that dysmenorrhœa is much more common among the highly educated and well-to-do classes than among the laboring classes. This is probably due to two causes: first, among the rich the law of survival of the fittest is interferred with; second, besides being enfeebled by bad hygienic

environments the girls of the rich, as they approach puberty are compelled to expend all available force in intellectual work at a time when the generative organs should be developed; even where a good constitution is inherited and sufficient exercise, food and sunlight allowed to fairly well develop the muscular system, if emotional and intellectual work is forced upon them during the period that the generative organs should be developed or allowed force to develop, they will be likely to suffer from dysmenorrhœa due to improper development of the generative organs. From 10 to 17 years good food, free open air exercise, and sunlight are especially needed and freedom from emotional excitement, care and anxiety is desirable; and all intellectual effort, that is laborious and absorbing should and can be deferred until full development of generative organs has been secured." And Goffe says in speaking of this period of life: "for the succeeding three or four years, say from 10 to 14 or from 12 to 16 the mental strain upon the girl should be diminished with the entire absence of all intellectual requirements during a few days each month of her sickness; this of course necessitates a complete separation of the girls' curriculum from that of the boy." In accordance with the above views set forth, and not in order to refute them, I began to gather health statistics of all girls whose ages would come within the range of 14 to 19; but my conclusions were not convincing, rather dissenting, as I found a far better standard of health and less local trouble than the above statements had warranted. To be sure, Wylie expects the results to influence their entire after life, to which these early observations naturally could not extend. The average age of the school-girl entering the eighth grade, where she spends one year, is 15 years, entering the High School at 16; and the average number of girls in each eighth grade is 25. I found the highest percentage of periodical absences in that school where the society element predominated; here one fifth of the girls were absent occasionally during menses, chiefly representatives from this class. These girls also averaged two music lessons per week making it quite evident that their indisposition is attributed largely to outside influences. The average number of periodical absences of other 8th grades equalled but two or three,

and some teachers knew not of a single case. The universal opinion was that the girls' general health is excellent and but one instance is recorded when a girl left school during entire past year on account of absolute ill health in any 8th grade, Wolfe Hall and University of Denver not excepted; but every teacher was very emphatic in her belief that school-life and society are incompatible. It would probably occur to you that very delicate girls would not cherish the thought of entering upon a four year's struggle in the High School and after finishing 7th or 8th grade would drop out and thus raise the average health standard of the High School; or after 16, the menstrual functions being established, less trouble would consequently arise from this source. But the teachers themselves appear to see little cause for apprehension as very few if any pupils hesitate about entering High School on account of defective health.

In North Denver the number of girls enrolled is sixty, and attendance fully as good as that of boys, and but two or three are excused habitually, while in neither of our two private schools could I learn of any periodical absences. Probably the East Denver High school, with an average attendance of over 450 girls annually, would furnish the best criterion upon which to base statistics. Average age of girl entering is 16 years; out of 470 enrolled during school year of '91 and '92, two left on account of contagious diseases, sixteen on account of general poor health, and in seven the disease was not specified; making a total of twenty-three, barring contagious diseases. During the school year just closed the number of girls enrolled was over 500; four girls left on account of contagious diseases, nineteen on account of general poor health, while in eleven the disease was not specified, making a total of thirty (barring contagious diseases), which is certainly an excellent record. It is quite the fashion among a certain class of non-ambitious girls to attribute their failures to toe the mark in the school-room to ill-health, or if she becomes discouraged she frequently volunteers the apology, "The doctor forbids my return to the school-room."

One of the pupils in the first-class of East Denver High

School made a personal canvass at my solicitation among a class of nineteen girls in order to determine the number of actual cases of dysmenorrhœa, but she had not one to report. I also questioned each teacher I came in contact with, regarding authentic instances of mental overwork occurring among girls; but not one could be recalled. I myself have met with but one such case, where, after graduating from a High School at 16, the precocious child was permitted to enter an Eastern College where she succumbed to socalled "brain-fever" .Socrates taught that a boy who has learned to speak is not too small for the sciences; but we are beginning to look upon a precocious intellect with distrust and seek to make it more subservient to the physical.

The average number of school hours for all higher grades is five hours daily, with one and one-half hours intermission for luncheon, as a rule, excepting in high schools, where but one-half hours interim is the rule. The average time for study during the school sessions is one and one-half hours, supplemented by one hour's work at home, four regular studies being required.

A number of leading writers maintain that the poor, not being subject to the same rigid laws and customs that civilization exacts from the cultured or the wealthier classes, are compensated by an almost utter exemption from local troubles. If such were really the case our fashionable *clientele* would predominate, which, however, does not chance so to be, as our bank accounts testify; for exposures, bodily fatigue and neglect during lying-in period, is at the root of much ill-health among the poor. Perhaps on account of a more normal nervous condition the latter are not discomfited to the same extent as their more neurasthenic sisters; still our public clinics abound with these very cases, and upon inquiry we are told of dysmenorrhœa, menorrhagia, difficult locomotion and pains in side from girlhood up, which are not due to the sequences of married life, as is so often conjectured. I find just as many cervical lacerations among the poor, but not seeking relief to the same extent as the more fortunately circumstanced, are not always recognized. Perhaps neglect during *accouchment* is partly

responsible for this large per cent. One of my most discouraging gynecological cases belongs to this class. During her last labor four years ago a mid-wife was hastily summoned, as the third stage seemed pending. This meddlesome personage waited but one-half hour when she administered a powerful oxytocic, although pains were already effective, and labor terminated just one hour from the time of her arrival. This patient had enjoyed excellent health prior to this precipitate delivery, but is now a confirmed invalid with threatened loss of mental balance from an array of different causes. How often we are summoned to replace a retroverted or prolapsed uterus occurring among the working class so frequently attributed to overlifting. Within the past two weeks I have been called to treat two such cases, and at the same time a *confrere* of mine was engaged upon a similar task. One was taken with violent flooding, the other resulted in complete procidentia and cystocele, which nothing but a pessary (which instrument I avoid as a rule) remedied My worst cases of prolapsus have invariably occurred among this hardy class who, according to certain authorities, ought to be able to resist local weaknesses on account of their superior physical development. Years ago, Dr. Mary Putnam Jacobi wrote: "It is in fact a matter of common observation that hysterical and anæmic women, in whom disordered menstruation is most frequently observed, are conspicuously destitute of habits implying either cerebral or spinal activity; that is, they neither think much nor take much physical exercise."

Prolonged bodily fatigue superinduced by overwork might be considered a common causative factor in many uterine affections, especially during the formative period, say from 10 years upwards. I have in mind two such cases, one of whom said to me at 21, "I wonder if I shall ever feel young again." She had been reared on a farm, and overburdened with heavy, menial work during her early years. Her pelvis is now a mass of adhesions, ovaries inactive, probably degenerated and dysmenorrhœa marked.

Pelvic troubles are appallingly frequent among peasant life in mother and daughter alike who probably never attended

even a country school for nine consecutive months; hysteria also is not unknown in rural homes. Apropos of the question of infantile uteri, I might cite a case not due to over study. I found the patient at 26 with local trouble of perhaps 12 years standing, markedly hysterical and appendages diseased. During the laparotomy performed as a last resort, the operator found the ovaries cystic and confined by marked adhesions and an undersized uterus, although patient was especially well developed physically. This history she gave me: Very little time had ever been spent in the school room; she had been literally robbed of her childhood as a woman's share of manual labor had been exacted from her from her 10th year, and her health which she never regained, was undermined at 14.

We know that England excels in vigorous womanhood, due doubtless in a great measure to out-of-door sports and especially to that most healthful of all exercises, walking in the open air. In this country the love of exercise is in its infancy and needs careful nursing to bring it to its full maturity.

Every American family is ambitious to keep a menial and thus the growing girl of studious habits is no longer pressed into unwilling service, with the result of lessened opportunities for exercise for she even grudges herself the time spent in rowing and swimming or in the tennis court. She remains indoors during recess by preference and also at noon, often nibbling at her cold lunch and studying between times until the afternoon session opens, while her active brother, in the meantime, shouted all the way home, relished a warm dinner, engaged in a little fisticuffing and then ran a foot race on his way to school. After the girl returns from school, music or dress absorb her time, while her brother is running errands for the entire neighborhood. Surely school work *per se*, is not the root of all evil, but the manner in which time is utilized; and parents and teachers both err in condoning this passive life.

It were far better if examinations for promotion were conducted at the opening of the school year and not when they occasion the maximum degree of worriment. It were a like improvement if discipline were relaxed from seventh grade up, especially near the termination of a school year, when tired na-

ture rebels. Respect for teacher should supplant fear; the mind chafes under the depressing influences of constant surveillance.

In some parts of the orient it is customary for the master of the house, when suspecting the character of a new comer, to at once salute him as an honored guest, by which hospitality and tact he insures his personal safety, for to be thus esteemed is to live up to his full requirements. It is this trait of inherent selfrespect that is appealed to when children are treated as behooves young men and women. I knew of one such an ideal school where the scholars have the liberty of the entire room; if the pupil feels the atmosphere oppressive he can wander out at will into the open air and get renewed inspiration from nature, and the children have never been known to infringe upon these rights.

True education comprehends an equal development of the moral, mental and physical elements in man; but the autocrats of the school room have, until within recent years, ignored the fact that it is both their prerogative as well as duty to improve the physique of their charges. Wellesley is one of the leaders in this reform; after one and one-half years experiment of three hours per week of practical gymnastics the improvement in the carriage and vigor of the young women and their increased capacity for mental application testify to its benign influence. Every freshman entering Wellesley is subjected to a thorough physical exercise, including measurements and strength tests. All methods of physical training spring originally from the two great primary systems, the German and the Swedish or Ling. Yahn, born in Germany in 1778 instituted the former, while Ling, of Stockholm, perfected the latter. The German system has been taught in the East Denver High School for the past nine years as well as in St. Louis, Chicago, Milwaukee and Kansas City public schools. The boys in all of our higher grades have military drill out of doors, while the girls' work is conducted in the main hall. The branch taught in East Denver is calisthenics and in West Denver a combination of calisthenics and physical culture is preferred. The Ling system is probably more scien-

tific but is acknowledged to be tiresome and monotonous and too much of a study when relaxation is the principal desideratum. It was an invaluable hint of Hippocrates that "the second best remedy is better than the best if the patient likes it best." For public school work that system which introduces the most life into the exercises and holds the attention of the pupil is usually the most successful, and this is what the German system claims to do; nevertheless North Denver will introduce the Ling system next year, and the exercises at Wolfe Hall will be conducted by a graduate of the Boston Normal School of Gymnastics, the chief exponent of the Ling system in America. Denver University has a full course still under advisement. The time allowed for gymnastics in high schools varies from 25 to 45 minutes weekly; 8th grades receive 45 minutes bimonthly instruction by a competent specialist, with 10 minutes daily review conducted by their every day teacher. In no school of Denver have measurements been taken, and the girls exercise in their snug street costumes. As it would be impracticable to don gymnasium suits they should wear constantly a sort of loose blouse or sailor waist to facilitate easy movements affording comfort to themselves and to the lookers-on. Singing is fortunately retained by all the public schools, 45 minutes per week for the high, 10 minutes daily for the seventh and eighth grades.

"As a tree is bent so it will incline;" habits acquired in the school-room as regards posture and use of eyes are carried through life with, too often, an accompanying infirmity. Correct standing—taking true military position—chest forward, and body resting on balls of feet, thus bringing strain and tensity of abdominal muscles into play, should be insisted upon uncompromisingly; but in order so to do the child must not be hampered by incorrect dress.

It is an auspicious sign of a progressive age to at last find the public educator and the physician joining hands and becoming counsellors. School gymnastics should be subject to direct medical supervision. An appointed physician could take measurements and examine the special organs and the special senses of the boys, while a woman medical director could act in

like capacity for the girls, and could also extend her usefulness still further by means of a few personal talks. If a victim of advanced organic heart trouble were to follow a course of general gymnastics, untold injury might be the sequence. If a neglected error of refraction goes on unaided it is certain to advance; where heriditary tendencies are strong, in such a child, studies requiring long continued and close application should be interdicted. High degrees of hypermetropia can be acquired up to 15th year, "when the bodily tissues in the growing child easily assume a wrong bent." Myopia is likewise rarely acquired after the 15th or 16th year. Then questions of ventilation and contagious diseases, incipient spinal affections, disposal of expectoration in the tuberculous, etc., would come up. How quickly a limp due to coxalgia is singled out by the physican, while mother and teacher put it in the category of "growing pains." A decided advance in the breathing capacity compared with pupils in lower altitudes was recognized by the instructor of gymnastics; acting upon this suggestion I took measurements of a number of healthy school-girls reared in this altitude and of an equal number from Eastern points and found the chest expansion decidedly increased; several girls under seventeen who were not singers boasting of a four inch expansion.

If you will pardon the digression I will relate to you how the East Denver High School is to deviate from the old *regime* and conduct a manual-training department, which will doubtless appeal to your good judgments. For the many pupils who are obliged to sacrifice the few remaining years of ordinary High School work to prepare for the activities of life this will form a stepping stone to future vocations; others not endowed with studious inclinations and capacities will recognize an opportunity to cultivate some hitherto neglected ingenuity, while to a third class the tedious routine and confinement of a four years High School life would be positively hurtful, physically considered. This course will ultimately serve to popularize certain so-called plebeian and homely duties that come under the domain of housekeeping, for domestic knowledge will be assimilated in such an harmonious atmosphere as to eliminate

every suggestion of servitude and degradation to the æsthetic young miss. I have frequently advised anæmic and listless patients who depended solely upon tonics and light fantastic Delsarte movements to develop their organism, to learn to excel in the culinary art and follow up the details of housework which would serve the double purpose of discipline and development and certainly not curtail their opportunities to shine resplendant in the drawing-room. I will not disillusion you by recounting the large percentage of my signal failures. The art of cooking will be preceded by a foundation knowledge in practical chemistry and at last is the scientific cook destined to find a a habitation in Colorado. The accomplished daughter will also here learn to shape her own garments and garnish her own head-gear. The classics will not adorn this course but French and German will happily be retained. The boys will receive special training in the use of tools, the girls joining them in wood carving, modeling etc. Out of the six school hours daily one will be devoted to mathematics, one to science, one to literature and language, one to drawing and two to the manual work detailed above.

One great factor in the etiology of ill-health of girls is the pernicious nature of their dress, fully 85 per cent in High School and eighth grades wearing corsets habitually. We comprehend the deleterious effects of constant, downward pressure upon the pelvic circulation of the growing girl, especially as she is naturally prone to assume faulty positions. The blood in the lower extremities flows against gravity and the veins of the pelvic region are not even provided with valves as elsewhere, naturally favoring stagnation. Thomas says; "In estimating the effects of direct pressure upon the position of the uterus, its extreme mobility must be constantly born in mind. No more striking evidence of this can be cited than the fact that in examining this organ with a Sims' speculum, if the clothing be not loosened around the waist, the cervix is thrown so far back into the hollow of the sacrum as to make its engagement in the field of the instrument often very difficult and attention to this point in the arrangement of the patient will at once remove the difficulty. While the uterus is

exposed by the speculum it will be found to ascend with every expiratory effort and descend with every inspiration. An organ so easily and decidedly influenced as to position by such slight causes must necessarily be effected by pressure at the waist line."

I examined twelve school-girls in order to estimate the exact influence corset-wearing would exert upon chest expansion, eight of whom were corset habitues but did *not* wear them tightly (of course) and four had always avoided them. The average infraclavicular expansion of those not addicted to corset wearing was 3½ inches and expansion at base of thorax 2½ inches. In the corset wearer I took two distinct measurements with and without corsets, with following results:

Infraclavicular expansion with corsets, 2 5-6 inches, Expansion at base of thorax, 1½ inches. Without corsets, infraclavicular expansion 3 inches, expansion at base of thorax, 2 5-12 inches, showing a gain of 11-12 of an inch in latter measurement if corset is discarded, while the compensatory clavicular expansion so often theorized about, was almost *nil.* It would be interesting to continue the investigation on a larger scale, especially in the adult. It would be necessary, however, to arrange separate statistics for the sturdy Coloradoan and the Eastern product.

During my eight years of public service I have rarely seen a gynæcological case without tendering unsought, but nevertheless appreciated, advice regarding her attire. We all know that the young lady complains of weak back, engendered by this constant artificial support to the spinal muscles; as obstetricians, we know also that tedious labors in this class depend largely upon flabby, undeveloped abdominal muscles requiring more frequent forceps applications. There must be something radically wrong with to-day's dress to enlist the sympathies of such an able body of women as represent the "Woman's National Council," who recently devoted one entire day to "reform in dress" at our famous "Woman's Congress." Their object was to evolve some manner of dress that would appeal particularly to the business woman, something at once comfortable and presentable. Lady Haberton, of England, is the chief exponent

of the "Syrian Costume," just as one of our own leaders pilots the "American Costume." The reports of the committee were not accessible to me, but I trust that the future costume may be a combination of utility, comfort and beauty, something that will not "challenge the attention and criticism of that dread street tribunal, the small boy."

We have no patience with the slovenly appearing young woman who deceives herself with the belief that she is leading the age in "dress reform" and who literally flounders about in her capacious habiliments and says: "I can't bear to have my clothing touch me, I dress hygienically." Walking caricatures of "ye olden time" dress reformer are relegated to the past. You may meet a young woman on the street to-morrow and consider her artistically and modernly gowned, but her appearance would never lead you to believe that she is an apostle of this movement. She is perfectly comfortable and free from the restriction of modern dress, she has on the latest approved union undergarments or their equivalent and of exact size; she usually wears a bifurcated skirt and her garments all depend from her shoulders with no superincumbent weight resting upon her hips or abdomen. She is not the deluded possessor of shoulder-straps either, which latter are not an unmixed evil on account of the direct local pressure exerted over mammary gland and upper part of lungs. She is corsetless, of course, and without bands, the garments being either union made or coapted in some ingenious manner, preferably a little above the waist line to insure their being suspended from the shoulders, which necessitates in itself moderate looseness at the waist.

No less an authority than Dr. William A. Hammond himself contends that corsets, constricting bands and *decollete* dresses are unproductive of harm, and that a woman's hips are a legitimate and proper support for the many skirts which she finds it necessary to wear. Of course there are women so splendidly endowed by nature that they can apparently ignore all common sense rules, but they are in the small minority and form dangerous examples. Correct dress is the basis of all hygienic progress and can lead indirectly to moral reforms as well. As long ago as 1866, Harriet Beecher Stowe wrote: "The

love of dress and glitter of fashion is getting to be a morbid, unhealthy epidemic which really eats away the nobleness and purity of women." A recent writer tritely remarks: "Daughters grow up and around a man like lilies of the field; they toil not neither do they spin, and yet I say unto you that Solomon in all his glory was not arrayed like one of these."

To recapitulate, the principal points I wished to emphasize were, first, that the modern school girl is not the helpless, fragile creature that some leading writers invite us to believe; that her school curriculum need not necessarily differ from that of the boy, if parents and teachers direct her health properly, feed and clothe her according to the most approved hygienic rules, discourage all emotional and unwholesome recreation, including fashionable society life, and substitute for it proper out-door exercise. Take away her puerile literature, which serves only to nourish delusions,and replace it with entertaining periodicals books and newspapers that she may foster a spirit of progress and keep abreast of the times. Help her to emancipate herself from the thraldom of custom and artificial inclinations. Teach her that it is not folly to be wise, and increase her regard for her own body by means of correct instruction in physiology and hygiene. Teach her to retain kindly charity, true womanly sympathy, a high standard of character, and above all give her something to do later on. Then will the popular argument that woman is physically disqualified to enter upon competitive work side by side with her natural competitor, become slightly *passe.*

DISCUSSION.

Dr. B. B. Davis. (of McCook, Neb.) Two years ago in the State University of Nebraska, we established a chair of Female Hygiene and employed to fill that chair a lady whose duty it was not only to teach the physiology of the female organs, but in addition to that, have a general oversight of the young ladies. At that institution, we have about 500 young ladies in attendance, and all of this lady's time is taken up in overlooking the affairs connected with that department. We have there a system of making measurements, and also a sys-

tem of compulsory physical culture, and in that way we found that there were a great many improvements made in the general health and physique of the female students.

To fill such a chair was very difficult, but we finally succeeded, and the result has been that the young ladies go to the instructor in female hygiene and discuss their difficulties. A result has been a decided increase in the attendance, and very few absentees on account of sickness. As one of the Regents of that University, I take a great deal of pleasure in stating these facts.

DR. COLLINS. This paper of Dr. Liebhardt's is one that we should be proud of as a Society. It is classical, it is practical, and it touches the very foundation of womanhood, which is as you know the fountain of all humanity. I agree with her most emphatically in all that part that I could hear.

Dr. Liebhardt has taken a position that should certainly be sustained by every intelligent physician, not only in societies, but in his daily work. If it were so perhaps we would have a more healthy and a more vigorous female population.

That the matter of dress and of school education is frequently at the foundation of pelvic diseases in the female I have not a doubt. From my own observation and experience, the fault lies largely in the school and with the school board. Perhaps they are the very choice of the communities in which they live; they may be intelligent and an honor to the community; but my experience is that they are not practical in regard to hygienic and physiologic processes. They lose sight of hygiene and physical culture and development in their pupils, in the effort to get them to a high grade of standing in their studies.

Now there is nothing truer in my mind than this: that a young woman in the beginning months of her menstrual life, should be viewed as upon the threshold of a possible disease of important organs, and her studies should be graded with that in mind. The mothers of our country are very modest ladies, and they do not speak to their daughters about this monthly function. They rarely have any information from their mothers. Sometimes perhaps their elder sisters are of benefit to them,

but the mothers seem to avoid this subject as one that should not be touched upon. The school boards of all our choice schools have not been educated to look in that direction; they should take it into consideration, and possibly, as Dr. Davis, of Nebraska, remarked this morning, also the appointment of a special chair. This idea should be carried out more generally than it is, and there is no doubt in the world that that position should be filled by a woman. Boys should be able to take care of themselves; they talk freely with each other, and if they are guilty of any indiscretions they freely tell one another, and when they are young men and approaching manhood they are pretty familiar with the unphysiologic effect of different things. Girls are different; they do not talk to each other often, they are peculiarly modest, and their modesty is to be commended, and more particularly, as they have had no education in that direction.

Dr. Liebhardt has taken a position, and read a paper that should be considered by every family physician, not by specialists alone; because we only see these cases after they become diseased, and require the attention of a specilaist, and for this reason, the family physician should be conversant with it.

When I had the honor to be President of this Society some years ago, a portion of my address was directed to this very thing.

Dr. Yoakum. I was very highly pleased with that paper from this stand-point, as the doctor has very truly said, that we as doctors, instead of encouraging disease, should cut down disease. We should not be protectors of disease, but we are, as long as we encourage in education, what Dr. Keating calls in his paper "The Cramming Process, Misnamed Education."

Now I believe that our asylums would not be half filled if we as doctors would take a firm ground against this cramming process. The first point that I wanted to notice, was that early education or early cramming, produced more mental diseases than everything else combined, and when our emotional and intellectual natures and volition are all weakened, then comes the physical weakness of the mind, then follow the troubles with the girls and the boys.

The next point I wish to call your attention to is the subject of dressing. Some of us say "abominable corset" and some say "blessed corset." I have never asked a patient yet, in my 21 years experience, if she wore her corsets tight but she said no. Now we all know, and Dr. Keating and Dr. Liebhardt have both proved in their papers, that tight lacing of girls displaces their uterine organs.

I am in favor of short day sessions, and one of our German physicians, advocates only two hours a day until 12 years old, with three recesses of one half hour between each session; and only three hours until they pass the age of puberty. They have tried this in schools in Germany, and have found that when they have reached the age of 17 and 18 years, that they were much better advanced than those that had undergone the "cramming process." We should learn a lesson from that.

All my girls are boys, but when I came to Denver, I asked if there was a school here with short day sessions, but I did not find it.

I think if we would advocate that a child up to 12 years of age should go to school only two hours each day, we would miss all these diseases, insanity, uterine diseases, and the like, that are so telling on our boys and girls.

I think that paper of Dr. Liebhardt's should be published, that our mothers and fathers might read such an article as that. I should like to see it published in our daily papers; I think such a paper as that, and one or two others read in this session, should be published to the world.

Dr. Davison. I was sorry I did not hear the first part of Dr. Liebhardt's paper; but I have learned something entirely new to me, and that is that women themselves are beginning to act in their own behalf. Certain institutions are now instructing their girls in the principles of anatomy and physiology. Ignorance, I think, is the direct cause of a good deal of trouble. If we could do away with a great deal of false modesty, and instruct women discretely, in the manner in which the doctor advocates, we would be advancing a good deal toward the solution of the problem.

The salvation of any race is dependent upon its women.

Where they have robust physique, and perfect pelvic health, the outcome of marriage will more often be children of corresponding physique. It is like breeding stock, where you have good antecedent factors, you will have good offspring, and a good example of race breeding. It is as true of the human kind as any other.

While custom does not permit of women proposing marriage to men, they have a powerful weapon in their refusal. It is only right that she should make up her mind that she will not lend herself to the production of tuberculosis, syphilis and other ailments, and should she exercise this power of rejection she would be doing the world at large a great good. She should refuse any man not of good physical constitution.

DR. ANDERSON. I have a few remarks to make on Dr. Liebhardt's paper, because it relates to me in my official capacity to a certain extent. As a school director my attention was called to the practice of not allowing children to go out whenever they want to; from this the children suffer without a doubt, and the female school teachers themselves often suffer. It is due largely to false modesty. I have treated a great many of them in the last quarter of a century, and having children of my own, and being familiar with the system of schools, my judgment has been that it is largely on account of the fact that teachers will not allow the children to go out when they want to that trouble results. We know that children can contain themselves for a remarkable length of time. I have had them to tell me that they thought it was all right when they had an operation once a week. We know that this is all wrong, and that it will bring on a train of troubles eventually. I have gone to teachers and told them that they must allow their children to go out when they want to, as I think that is a fundamental principle of much trouble.

DR. KAHN. I have found it necessary in several instances where I found this constipated condition in girls of 13 and 14 years of age, to write the teacher a note, asking him to allow the pupils to go out when they felt the desire, and not have them wait for permission, and I invariably have had good re-

sults therefrom. The teachers are very kind to their pupils if they think they are in need of medical advice.

I think that is one of the prime factors in the cause of disease among children or growing girls; and as Dr. Collins has said, the one thing they require more than anything else is, good medical advice about that time.

DR. WILSON. Before we call on Dr. Liebhardt to close this discussion I desire to say a few words. It has appeared to me for years that our children were over-worked in school. It is perfectly clear that many of the boys and girls are going through our school curriculum without injury to themselves; but there are many others who cannot do it. If you crowd the intellectual part of the human organism with an extraordinary amount of work, you to that very extent deplete and injure other portions of the same system. The intellectual is cultivated at the expense of the physical portion of many of our children. In the mad rush for high standing in their classes, and to insure the passing of grades, the natural energies of many are overtaxed. Some of our teachers, I fear, rather than not have ideal scholars, would crush the bud before it had time to blossom in beauty or ripen in fruitage. The course of study in many of our schools seems to have been concocted on this theory. It is alleged that one of the principal reasons our girls have trouble in their studies in school is that during the school term they are in society more or less, or are allowed to spend too much of their time in reading works of fiction. These are old arguments which teachers have been flinging broadcast for generations. It is not reasonable to suppose that girls can be confined during their school days wholly to the duties of the school. Boys when out of the school room roam at large, take all manner of exercise for hours daily. But girls when out of school are generally shut up in their homes, and to a considerable extent unemployed. Under proper restrictions school girls should have all the out-door exercise consonant with their nature, and social advantages, both for personal enjoyment and for that culture in the manners of polite society necessary for the demands which will be made upon them. Some relaxation from the stern duties of the school room is a necessity with the

girls as well as the boys. If you confine them closely to the duties of the school room life will be irksome, if not a burden. Some illustrations of this have been witnessed in our schools in both sexes, during the last few years. A young lady from one of our high schools recently came down with typhoid fever. In her fever and delirium she was constantly bemoaning the consequences which would result from her absence from school. She would say in most pathetic tones: "Oh, I know I will not pass my grade. I must get right up and go to school; let me go won't you?" And these utterances continued for days, and were most heart-rendering to her friends and attendants. While everything was done to divert her mind and compose her and to stay the ravages of the disease, it terminated fatally as was feared, both from the severity of the disease and her overwrought mental condition. Scholars are in constant fear of not passing their grades, the nervous system is strained from beginning to end. This fear chills and freezes the mind, never gaining a generous soul. Just before the schools of the city closed for the summer vacation, a little boy was called upon in one of these schools to make his speech, and, forgetting a word, made a failure, going home in a fever, an attack of measles soon developed, with elevated temperature and slight mental unbalance, when his lamentations over his failure at school were frequently heard. He said, among other things, "if the teacher had told me one word I would have known all the rest." What is the reason the teacher could not have told him that one word? Our teachers should be more sympathetic, they should more generally love the taught, and while you cannot constrain them to love those who are unlovable, yet "Sweet is the love that comes with willingness." The duties of the school room should not be so great and distasteful as to make the school life the most miserable of the whole period of existence. Children should be taught their lessons in the school room, without tears, and when tears are brought to their cheeks there is usually something wrong, and it is not always with the child.

DR. LIEBHARDT. The word "society" as I used it is applicable to evening entertainments, in overheated rooms, includ-

ing late suppers, late hours, etc. Usually the young ladies of the High School go in full evening dress, and it never occurs to them to think of returning home before 10 or 11 o'clock, and even later, and the next morning they are expected to keep up with their classes. It is to be deplored that the entertainments for girls do not take place more commonly in the day time, as they do abroad, Saturday afternoons for instance.

THE INFLUENCE OF CHILD LIFE IN THE PRODUCTION OF DISEASE IN WOMEN.

By J. M. Keating, M. D., Colorado Springs.

I have often thought, judging from my own experience that the line which separates pediatrics from gynæcology is an extremely feeble one, if, indeed, any exists at all, for I find that the more one studies the cases that enter the average practice of physicians the more one comes across conditions which give rise to symptoms for which relief is sought that are dependent on what are known as development processes.

It is very difficult to get a proper title for the remarks which I propose to make to you to-day, and possibly it will be well for me to explain more at length the subject of this paper before I discuss with you its various phases. We constantly come across conditions depending upon various uterine anatomical disturbances that undoubtedly are more or less the causes of symptoms for which the patients have sought relief, and the question arises whether these changes from the normal are congenital or whether they have come from some cause which has acted during development, and which, by judicious training, could have been avoided. Undoubtedly, although much advice is given and a proper hygienic and general management of infants and children are understood, we are constantly confronted with the fact that very little attention has been paid to these matters by mothers and even family physicians. The wonder

ful changes that take place just before puberty in the sexual system of girls are totally overlooked in the artificial life which has proceeded from the natural advances in civilization, and though we are constantly endeavoring to counterbalance the evil effects of an artifical existance, by attempts at producing anatomical perfection, how often are these measures themselves not more liable to increase than to diminish the very force that they attempt to correct? Nutrition forms the basis of all proper anatomical structure, but by nutrition we do not mean spasmodic efforts at antidoting the evil influences which are constantly at work, but a nutrition which is established at the very commencement of life and which is progressive and constant and uninterrupted. Is it not possible that the constant change which has taken place in the last few years from the extreme sedentary life of girlhood, with its evil effects, to the opposite craze for indiscriminate exercise and wholesale gymnastics, including calisthenics, posturing and many out-door games is productive of harm?

Let us study for a moment the appearance of the uterus at birth. It was my custom for a number of years in making *post mortem* examinations in infants to carefully examine the uterus, in order to determine as far as possible in my own small experience, how many cases of congenital deformity existed which would account for the conditions that are found there after puberty. I recall none. We must remember that the pelvic cavity in the child is but slightly developed and that the uterus, like the bladder, is higher above the pelvic brim, that it is inclined forward and is somewhat ante-flexed; but the most marked differences, which you will find by consulting Courty, are noticed from age to age in the antagonism of the body to the neck. In the child according to this author, the neck is very large, the body very small; the neck is almost cylindrical; the body is triangular, more flattened than in the adult. The isthmus is indicated at this age less by a contraction than a change of direction between the neck and the body, which gives rise to a slight ante-flexion of the body on the cervix. But at puberty the neck, instead of remaining cylindrical, has assumed the form of a small barrel, contracted

above, tapering below, and is shorter. According to Cusco, the anterior reflection on the body and neck diminishes, owing to unequal development; it being greater on the anterior than on the posterior surface, helps to straighten the organ, leaving but a slight degree of ante-flexion, or rather of inclination forward. Should anything occur in the process of development which will act upon the uterus in its infantile condition, it may alter its natural position and so be the starting point of abnormal growth which is recognized in the adult by flexions and versions, torsions and displacements, which either constitute disease or complicate by disturbing function. It is especially to this class of cases that I desire to call your attention. Believing then the majority of the so-called congenital deformities are comparatively rare, we are driven to the conclusion that uterine deviations from the normal, which are so common at puberty, are the results of certain processes which occur between birth and puberty, possibly as the result of interference with nature's laws. At exactly at what age these deviations are more likely to occur is a very difficult matter to decide; but the probability is that the association of mechanical means with developmental processes is more intimate at the period just before puberty, and it is to this time I think that especial attention to young girls should be directed. It is surprising how few young girls one meets with who are absolutely normal at puberty in the establishment of menstruation, and if we are to believe that the menstrual function should be one free from pain, the number of normal cases is surprisingly small. The most common condition which one finds associated in the virgin with dysmenorrhœa is an ante-flexion, and this we have, according to most authors, divided into flexions of the cervix, flexions of the body and pathological ante-flexions of Schultze, the latter a result more or less of peri-uterine inflammation. The study of posterior displacements we will take up at another time. As these are nearly always pathological, hardly ever congenital, and developed as the result of morbid alteration, congenital retro-flexion is exceedingly rare. I do not propose to weary you with a long article on uterine displacements, but merely to make a few remarks upon the subject of these dis-

placements, as found in young women, with special reference to their cause, the influence they have on menstruation, their prevention and their cure. If we agree that at a certain period in its development the uterus takes upon itself certain forms, which in after life are going to interfere with its proper function, it becomes us to study the method of its development and the forces which act in distorting it. According to Schultze, the word "puerile" ante-flexion is preferable to "congenital." because it constitutes an arrested development which the uterus exhibits, the type of that of a child, such as shortness of the vagina, especially of the anterior wall, slender conoidal forms of the vaginal portion, the os very small and the excessive flexibility at the transition of the cervix into the body of the uterus, in consequence of which ante-flexion at an acute angle is very likely to take place. The point of junction between the body and the cervix is the typical place at which flexion is most frequently found, and, according to Graily Hewitt, softness of the uterus is a powerful predisposing cause. (Geo. T. Harrison, page 1103, Am. System of Gyn., Vol. 2). I call your special attention to this last remark. According to the interesting researches of Roujet, it must be borne in mind that the uterus is an erectile organ, and that the broad ligaments are not a simple fold of peritoneum, but any expansion of the lateral portions of the uterus, or rather its adjacent muscular fold, made up of bundles of smooth fibres with the serous folds adhering to them very closely; in fact, these bundles of fibres are found continuously in the utero-sacral ligaments and the posterior folds of the broad ligaments, intermingling in the stroma of the ovary and enclose the Graafian vessels in the meshes of their net work. For more extended accounts of this, I refer you to the quotation from this paper. (Courty, page 45). The author observes that the movements of the uterus are also due to the morbid or spasmodic contractions of this superficial muscular layer. Courty goes on to state that this contraction is itself the starting-point of the erection of the ovary and uterus, and gives us a most interesting account of how in the dead, the uterus, if found unimpregnated, will sink into the pelvic cavity and yield to

every movement communicated to it; and how if the uterine veins are injected, if the pelvis be placed in hot water the uterus will straighten itself in the axis of the neck and be accompanied by marked change in size and form, becoming more convex in front but especially behind. One has only to examine the uterus in a dead body to recognize this fact, by comparing it with the firm elastic sensation of that found in life, even under anesthesia. We all recognize the fact that normal muscular contractility is largely dependent for its energy upon good nutrition, that anæmia is one of the most powerful causes of debility, and we will see at once how close the relationship must be between the tone of a healthy body in its resistance to outside influences which may cause disease. Let me now direct your attention to what I consider one of the most important causes of uterine displacements found at puberty. We usually find that the girls who suffer from dysmenorrhœa are anæmic, have outgrown their strength, have been burdened with mental forcing and deprived of fresh air and proper food, the girls who have been sedentary in their pursuits. We have here all the conditions that diminish muscular tonicity, and all that is necessary is for the uterus to receive an impulse which will exaggerate its normal ante-flexion. The mechanical pressure which is exerted first by constipation, that most prevalent condition of child life, which is carried on through womanhood, the indigestions which produce flatulence, the occasional purgatives which act mechanically in causing pressure, the stooped position which adds its quotum, and the gradual bending of the toneless uterus, until it soon causes pressure on the bladder. Then from this latter we have the constant desire to urinate which keeps the bladder empty and acts in this way with the others at determining a flexed condition. I believe that in this way the majority of ante-flexions are brought about. Of course it would occupy too much time to enter into a discussion of those cases which have perimetric inflammation and pathological changes in the uterus itself. These have been termed pathological by Schultze, in contradistinction to "puerile," which is the subject of our discussion. It is not necessary for us to dwell upon the question as to whether the dysmenorrhœa

of these cases is due to actual stenosis of the internal os or not; suffice it to say that in my own opinion puerile flexions, however acute in their angle, need not necessarly be accompanied by dysmenorrhœa, and that therefore actual stenosis may not exist. But we undoubtedly have associated with all the conditions of mal-nutrition, which are productive of this state of affairs. a hyperæsthesia at the internal os which will produce a neuralgia or spasmodic contraction equal to that which would be produced by anatomical stenosis. Neuralgia is one of the accompaniments of mal-nutrition and flexions are not necessarily of themselves the cause of menstrual pain.

In a paper which I had the pleasure of presenting to you at our last meeting, I expressed this thought more at length, and simply bring it in here to reiterate the statement so expressed. It, to my mind, has a very important bearing upon the treatment. Those of you who will glance over the first volume of Lawson Tait's book on "Diseases of Women and Abdominal Surgery" and to turn to the pages on infantile uterus will note that the word "Infantile" is the one used for this condition. But as we have noted, the infantile uterus is entirely different in its appearance from the ante-flexed uterus found at puberty. It would be far better to drop this word altogether and use it only in those cases where the whole organ is subjected to non-development. In 1888 Dr. Arthur Johnson (Transaction Medical Gynæcological Society) showed distinctly that the cervix and the body of the uterus have not merely an anatomical distinction, but distinctions of function and pathological changes most marked; that the arrest of development in the cervix and the continuation of development in the fundus would naturally lead to a want of resistance at their junction, to be influenced by mechanical causes, is apparent. But, of course, careful discrimination has to be made between these cases and those in which absolute arrest and development have taken place in the whole organ, or that portion of it, viz.: the fundus, which is especially employed in the process of menstruation and parturition. Why is it then that Lawson Tait tells us that a want of development of the uterus sufficient to give rise to menstrual trouble and be a bar to pregnancy,

constitutes half of his private practice and a large proportion of the out-hospital practice. Certainly so large a proportion is not due to congenital deficiency, but the cause must come at a later period. He says that he has a strong and growing belief that the exanthematic diseases of childhood are largely to be charged with this result. I certainly cannot see the force of his argument, and it would seem to be an exceedingly difficult matter to prove. I believe that we have to look to a far more lasting and lingering condition to account for a process so persistent and insiduous as is nutrition. The exanthemata last practically for a few days, but improper feeding starts in infancy. Want of hygiene, faulty clothing, mental cramming (misnamed education) extend for years. Nutrition requires blood, plenty of it and good blood at that, to make a healthy organ. I may then say that I do not believe that the word "congenital," which is attached so often to these cases when a patient first seeks advice, is at all a proper one; and that a condition which has arisen during a growing period, which has resulted in more or less deformity, can not be overcome in the majority of cases by the usual treatment which is given to it, but requires as careful a study and as presevering a course as would the development of a certain group of muscles or the straightening of a laterally deflected spine. Of course if the uterus is perfectly healthy, and for some reason or other there is some contraction of the cervical canal at the internal os and hyperæsthesia of the mucous membrane, intensified in the married life, and rapid dilatation with proper treatment is resorted to, so as to permit of pregnancy, the patient may be entirely relieved for the future. The same may be said for the single woman,and her dysmenorrhœa, if due to this cause, may entirely disappear. But the dysmenorrhœa of an ante-flexion which is well marked will not always be followed by such good results under such treatment. The uterus may straighten, but it is toneless and will at once relapse. Ordinary pessaries are of no earthly use, and any treatment which is of any avail in such cases seems to me to be the one which will increase the nutrition of the organ, promote its normal erectility upon the influence of a proper supply of blood and eventually enable it to

perform its function through muscular action and an open non-sensitive canal. Modern treatment, used by many, is etherization, rapid dilatation, copious hot water irrigation and possibly glycerine tampons, or a pessary of some sort. The uterus is depleted, weakened by this means. To be sure, the spasm is temporarily overcome and the patient, relieved for the time being, but soon finds that the relief is only temporary. Seeking advice elsewhere, she starts on her rounds from one doctor to another. Violent exercise may suddenly turn the uterus backward. This being an unnatural position, causes irritation, prolapse, constipation, and finally perimetric adhesions form. Then resort is had to forcible replacement, or once more the inevitable hot water and glycerine tampon. The uterus is replaced. It has to be kept there. The dysmenorrhœa, or some form of menstrual disturbance, continues and possibly Alexander's operation, or ventral fixation, is resorted to, to suspend the organ which has lost its normal erectility and no longer can depend upon its natural supports. Lawson Tait tells us that he has found that mere division of the cervix (and I suppose he includes divulsion also by the rapid method), is a harmless proceeding, but as the results cannot be maintained without the subsequent use of the stem, the two proceedings are involved in condemnation. As he is at present much opposed to stems, he discountenances this treatment and adopts instead dilatation, which he finds far more satisfactory, *i. e.*, he gets what he calls temporary relief. But I cannot help thinking that the occasional dilatation does far more good than simply dilate, it stimulates; and that is exactly what we want. Prof. T. G. Thomas (*Annals of Gyœcology and Pediatry*, May, 1893, p. 407), in cases of irreducible corporeal or cervico-corporeal ante-flexion, believes in dilating the cervical canal, first with graduated dilators and then with Ellinger's dilator, under anæsthesia, until he has stretched the whole canal of the cervix, especially the internal os; after which he introduces a glass stem, which he believes is far safer than any other substance one can employ, which is kept in position by a sustaining pessary. This is done under the most thorough antiseptic precautions, and though he considers it a dangerous, he

believes it a thoroughly warrantable treatment, and tells us he has treated many hundred cases of ante-flexion in this way and has never had a fatal issue; but in cases of true cervical flexion he does not accomplish much good.

We thus see that in reducible ante-flections treated in this way we have all the indications covered, especially those which increase the nutrition of the organ and its muscular investiture. In my experience I have had occasion to find that simple occasional dilatation, even when done under an anæsthetic, is not sufficient to accomplish in all cases what we want, and that the theory which has accomplished such good results in practice in the method adopted by Dr. Thomas necessitates a uterine splint which will maintain the uterus until it is strong enough to become functionally active. But I have also found that in a large number of cases this can be accomplished by a treatment which I believe is attended with less danger, if carefully done, and which will produce results equally satisfactory, and in a few words I will describe my own method of carrying this out. I first etherize, and, under most careful antiseptic measures, dilate the canal, having previously assured myself that no adhesions exist,simply inflammation in the uterus or its surroundings. I have sometimes found that the flexion is so acute that it is impossible to get my dilator through the internal os. I then in these cases dilate as much as possible and trust to future treatment to accomplish this result. I have lately had made for me by Mr. Durbin, of Denver, an Ellinger's dilator, of which the dilating portion is made of copper, subsequently plated like a uterine sound, capable of being bent at whatever angle I wish, and at the same time, being sufficiently strong, I think, to accomplish all the stretching that is required.

Having accomplished this primary operation, I then two or three times a week, again under antiseptic measures but without an anaesthetic, pass my dilator and gradually accustom the uterine canal to the use of a foreign body, stretch gently until slight pain is felt, at the same time endeavoring by supra-pubic pressure to somewhat straighten the uterus. I swab out the canal thoroughly with creoline water and place a wool tampon made perfectly antiseptic with creoline in the vagina and pack it

as far front as possible, endeavoring to get the os behind. I now use a mild Faradic current, either antero-posterially or with one electrode in the vagina. I direct my patient to try to accustom herself to urinate at stated intervals, and to endeavor to overome a constant desire, which has become a habit. I use tonics, especially arsenic, to improve the blood, and order bromide of potash in ten grain doses, with a citrate of potash in the form of neutral mixture, three times daily for a week before the menstrual period. I order the patient, if constipated, a mild aperient when needed, in the form of a wine-glassful of Rubinat water, and once a week at least, an enema for the lower bowel. I leave the tampon in for two or three days till the morning of the next treatment and order the patient, previous to its withdrawal, to introduce a small quantity of creoline water to facilitate the removal of the tampon, and then to irrigate thoroughly with a pint of cool water, which is acidulated with lactic acid about one per cent. I believe that by this means we stimulate the uterus to development, encourage its erectility, overcome the hyperæsthesia of its mucous membrane, make the menstrual blood more fluid and less liable to clot, and ensure the least liability to the establishment of inflammation. I encourage my patient in outdoor pursuits, but prohibit all form of gymnastic or calisthenic exercise, contortions, tennis or horseback riding that will be productive of strain and local venous engorgements.

There seems to be a common impression amongst mothers either that the uterus does not exist, or that certainly it has no diseases prior to the appearance of menstruation, and I fear that we do very little to impress upon them the facts which I have endeavored to outline in this paper. Our brothers the oculists certainly have preceded us by their study of the ocular defects in childhood, and the result of their work is apparent in the great attention paid today to the improvement of the hygiene in schools. We should impress upon a mother that the future well-being of her daughter greatly depends upon her watchfulness during the few years that precede puberty. She should acquaint herself with those books that tell her how her daughter is to be gradually trained towards the perfection of her men-

strual function, that her sons and daughters are to be brought up only on an equality that tends to produce the most perfect of its kind. And that the girl who is thoughtless of sex and anxious only to compete with her brother, will invariably sacrifice the attainment of her full perfection for a condition that will handicap her for the rest of her life.

DISCUSSION.

DR. COLLINS. I would like to say in regard to Dr. Keating's paper, that I approve of his position in many respects.

As I was going to lunch I had a medical friend in my buggy who seemed to entertain the idea that some of the positions taken by Dr. Keating were rather far fetched; but I soon convinced him that they were not so. I took the position that a young girl approaching the age of puberty, say from 10 to 13 or 14 years of age, should be the subject of intelligent observation by the family physician; if he finds that she has certain symptoms indicative of derangement of certain organs which would suggest themselves to him as an observant family physician, he should after a certain time at least diagnose, and insist on proper exercise and hygienic treatment.

One of the earliest symptoms of derangement of the pelvic organs of girls, is a persistent leucorrhœa. You find it in girls 5 or 6 years of age, and as the mucous membrane which lines the vagina, is continuous through the Fallopian tubes, and a diseased condition of the membrane may result in peritonitis, that fact should be present in the mind of the family physician.

Now as to examining young girls. It is not necessary that young girls should be examined through the vagina. Of course there are certain conditions where an examination through the vaginal canal is necessary, but the majority can be examined through the rectum, aud by this examination, engorgement, and displacement of the uterus and pelvic organs can be readily determined, and those conditions arising from a disease of these can be remedied through the rectum; it is not necessary to invade the vagina at all for this purpose.

Beside that, in regard to the rectum, it is the outlet of the great sewer of the body, and is frequently at fault itself in

those cases we are now discussing, and in an investigation of the pelvic organs through the rectum, you can readily detect any diseased condition of the rectum itself, and often the cause is found locally in the rectum. It may be a torpid rectum, or one that does not distend readily.

These observations made at random and hurridly, I hope the general practitioners present will take into consideration. Specialists as a matter of course, have them before them all the time; their minds are usually turned in this direction, but the fault lies in the family physician, and when these cases come to the specialist, they demand a longer and more tedious course of treatment for their remedy.

ADDRESS IN GYNÆCOLOGY.

ABSTRACTS.

By J. W. Collins, M. D., Denver.

Abdominal Exploration under Anesthesia.—Edward J. Ill enters a strong plea for the use of anesthesia in the differential diagnosis of pelvic and abdominal troubles, and especially tumors of small size, when there is muscular rigidity, involuntary muscular spasm, pain or nymphomania. The method is certainly too little used, though it is often indispensable to accurate knowledge.

Abdominal Section.—Reuben Peterson records twenty-five cases; twenty-three were for tubal or ovarian disease, one for pyelo-nephritis, and one for chronic ileo-cecal abcess; two deaths, one from shock in case of double pyo-salpinx, and one from sepsis in case of ileo-cecal abcess. X. O. Werder records fifty cases; thirty-four were ovariotomies—including under this term all ovarian tumors and all cases of removal of ovaries and tubes—with four deaths; four were operations for tubal pregnancy, all of which recovered; three myomectomies with one intraperitoneal and two extraperitoneal treatments of pedicle, with

one death; three hysterectomies with extraperitoneal treatment of pedicle, all of whom recovered; one gastro-enterostomy, with recovery; one operation for cyst of the broad ligament, with recovery, and four exploratory incisions. Anna M. Fullerton gives a tabulated statement of one hundred and seventy-nine operations recently performed in the Woman's Hospital of Philadelphia, with nineteen deaths. These deaths were all from practically unavoidable causes,and occurred in cases where the disease had been neglected and the patient was already septic or much debilitated, and are used as a plea for early diagnosis and early operation.

Bacteria in Skin Stitches.– Robb and Ghrisky, after an elaborate series of bacteriological investigations, conclude that a wound at some time of its existance always contains organisms. They occur either on the stitches or in the secretions. The number of bacteria is influenced by the constricting action of the ligatures or drainage tube, or anything interfering with the circulation of the tissues. The virulence of the organisms present will influence the progress of the wound. The body temperature is invariably elevated if the bacteria are virulent; and, indeed, in cases where many of the less virulent organisms are found, almost without exception there is some rise of temperature. Different suture materials offer different opportunities for bacterial development. The cat-gut suture would seem to be the best adapted to their growth. In the event of the presence of the streptococcus pyogenes or staphylococcus pyogenes aureus infection, such cases should be isolated as far as possible, to prevent the infection of subsequent cases, which almost invariably follows where isolation is not practiced. We have no sure and absolute method of rendering the field of operation entirely free from organisms, owing to the impracticability of destroying them in the superficial layers of the skin. The staphylococcus epidermidis albus (skin coccus) is found in the skin with such regularity that the latter situation may, for all practical purposes, be regarded as its natural habitat; and our methods are not successful in reaching those bacteria in the depths of this structure. It has been proven that the use orper manganate of potassium and oxalic acid in disinfecting

the skin reduces the danger of infection from this score to a minimum.

Cancer of the Uterus.—J. E. Janvrin most heartily recommends vaginal hysterectomy, not only in cases of cancerous disease of the uterus as long as the disease is limited to the uterus itself, as recommended by Martin and all other operators, but also in all cases in which the vaginal mucous membrane has been attacked, but in which the subjacent tissues are not involved, and also in all cases in which the thickening in the broad ligaments, tubes, ovaries, or peritoneum is presumed, after a most careful examination of the case, to be purely of an inflammatory or plastic character. A. J.C. Skene believes that there are certain organizations, especially those of a chlorotic order, where the circulatory apparatus is imperfect, and where they are prone to degenerations of all kinds—renal, hepatic, and so on—the cases that are always most liable to develop malignant disease, in which it is almost useless to employ any surgical treatment; for if they apparently recover, and the operation is as complete as it can be, the disease almost immediately recurs. Perhaps those might be said to have the cancerous diathesis in variously marked degrees. Now, it is quite possible that as we acquire more skill in detecting this diathetic condition, we may be able to extend or contract the limits of surgical interference in malignant disease of the uterus. Cordier believes, first, the justifiableness of early hysterectomy in these cases is unquestionable; second, if the operation is performed early many cases are permanently cured; third, tubal and ovarian diseases are frequent complications; fourth, in every hysterectomy for malignancy the appendages should be removed also; fifth, all escharotics, caustics, and tinkering should be condemned in treating these cases; they never cure, but often make complications; sixth, complete extirpation, as compared to amputation of the cervix is attended with low death rate and a greater percentage of cures; seventh, a few cases can be treated only by abdominal total extirpation, owing to the size of the uterus and the presence of solid tumors of the ovaries. Wallace Taylor pleads for the more frequent use of the actual cautery in inoperable carcinoma, and relates a number of cases.

Cervix Uteri.—Wm. H. Baker records three cases in which he treated hypertrophic elongation of the cervix very satisfactorily as follows: After the cervix has been restored to its natural position by inverting the patient or putting her in the knee-chest position, she is to be carefully let down into the Sim's position, keeping the shoulders all the time well down on the table, so that the uterus be not disturbed from the position attained. The perineum is then to be retracted with a Sim's speculum and the cervix held steadily in situ with a tenaculum buried deeply into its face, great care being taken not to draw down the cervix. With a scalpel then a portion of the infravaginal cervix is to be sliced off, of sufficient depth to insure the exposure, if possible, of the lower portion of the supravaginal tissue, and this even if the portion removed be cone-shaped, which is easily accomplished by keeping up a steady traction on the face of the cervix all the time that we are making our circular incision. This can be done without fear of hemorrhage, as the only arteries which are likely to give trouble are of small size and near the vaginal covering of the cervix. Bleeding from these is readily controlled by the pressure forceps. A very narrow tip of the cautery, not over one-eighth of an inch in diameter, is now to be brought to a white heat, and, selecting a point midway from the cervical canal to the vaginal covering of the cervix, it is to be quickly inserted up the long axis of that organ to the distance of a full inch, care being taken that the relative distance of the points mentioned is maintained. This is to be repeated at four equidistant places around the cervical canal. The stump is then to be covered by drawing the vaginal mucous membrane over it with sutures, care being taken to protect the os externum by two or three sutures on both anterior and posterior border, inserted so as to bring the cervical and vaginal membranes in good apposition on each side. Subsequent treatment same as after trachelorrhaphy. Jonhson-Alloway records ninety-one cases of excision (Schrœder's) of the cervix in cases of long standing laceration and proliferating endometritis. He finds the operation has no bad influence on future pregnancy, is easy of performance, and effective.

Dysmenorrhea.—Madden says: It can not be too explicitly stated that in every case and form of dysmenorrhœa there is one common factor in the causation of the complaint to be reckoned with, viz: some obstruction, physical or mechanical, to the free escape of catamenial outflow, which impediment may be due either to the condition of the parts concerned in the menstrual function, or to the character of the resulting discharge; and on the recognition and removal of that obstacle, whether by constitutional remedies, as may be possible in certain instances, or by local measures, as is necessary in a far greater number of cases, will be found the key to the general pathology and successful treatment of painful menstruation. This general statement is, I think, equally applicable to every variety of dysmenorrhea, not only in its uterine forms, but also to those no less important cases in which the causes of the complaint are traceable to the condition of the ovaries or of the fallopian tubes. James Oliver, in treating "functional" dysmenorrhea, recommends that the food should be as plain and simple as possible. A fair amount of exercise should be recommended, and the attempt should be made to establish the habit of emptying the lower bowel of its contents daily, and preferably in the morning. In those cases in which there is pain with sickness, no matter whether the disturbance is central or in the organs themselves, he finds it advantageous to administer a large dose of bromide every night at bedtime for one week, midway between the periods, and five grains of antipyrine every hour, beginning as soon as the pain or discomfort which precedes the menstrual process is experienced, and continued, if necessary, until six doses are taken. When the discharge is scanty, and especially when the pain appears to be due to vascular spasm, the patient should be recommended to take each night, for six nights before an expected period, a hot bath, and thereafter a mixture containing the three bromides, the dose varying from ten to twenty grains of each. If the pain appears to be due to derangement of the gastro-intestinal tract, a mixture containing either chloride of calcium or hypophosphite of lime should be administered during the intermenstrual epoch.

Ectopic Gestation.—Brockman, having written to various

authorities to learn their views as to the treatment of ectopic gestation, summarizes his answers as follows: Emmet, Thomas, Munde, Battey and McLean inform me they would attempt to destroy fetus by electricity where seen early. Spencer Wells would generally use it when seen early. Sutton would use electricity if the patient was very weak and not a fit subject for laparatomy, otherwise remove ovum. Englemann, who was formerly a warm advocate of electricity, says he now prefers the knife except in very favorable cases. Harris favors the use of the knife, as electricity is uncertain and apt to be disappointing. Byford would use electricity before the eighth week, but from eighth to sixteenth week would remove tube. Joseph Price would "*never* use electricity or any other means of destroying fetus, but remove the murderous thing whenever found from the first to tenth week." Baldy, Goodell, Tait, A. Martin, Gusserow, Kaltenbach, and C. Braun would not use electricity, but remove the ovum at once. None would use any other means of destroying fetus or risk waiting for rupture; all prefer stopping gestation as soon as possible when discovered early. Regarding the mode of procedure in cases seen at a later period, *i. e.* where the patient and pregnancy have survived rupture, and before the period of viability, there is a like diversity of opinion. Harris, Price, Case, Braun and Gusserow would remove the ovum by operation as soon as diagnosis was made. Spencer Wells thinks it "safest to remove ovum," but adds, "there might be a case where the wishes of the patient or friends would favor waiting for viability." Kaltenbach would wait for viability, but adds, "it is safest to operate six weeks after death of child." Gusserow would operate only when case was in favorable condition, otherwise wait for viability; but if it is not very important to save the child, would wait until death of child. Skene would wait until after death of child, as this gives best chance of recovery for mother. Tait would do all he could to save living child, if it had survived rupture. Goodell, Byford, Sutton, McLean, and Emmet would wait for viability and attempt to save both mother and child. Englemann would operate at once if child was feeble or mother suffering; but if conditions were favorable, wait for viability. Battey says: "If

the bowels are obstructed or symptoms are grave operate at once; otherwise wait for more urgent symptoms."

The management of the placenta has been a vexed question with all operators who attempt to save the child or operate soon after fetal death and before its exfoliation or absorption. Heretofore the question has been when to operate, but now it is "how to operate." To deal properly with the sac and placenta requires all the surgical skill and ingenuity that can be brought to bear on the case. Dr. Emmet says: "Experience seems to teach that it is safest not to attempt to remove the placenta." Harris advises us, "If the child is alive, to excise the sac entire; but if the child has been dead sometime remove the fetus and await the exfoliation of sac and placenta." Carl Braun and A. Martin would remove placenta at the time of operation. T. G. Thomas would leave placenta and drain. Munde would "remove placenta, if possible; if not, leave it and drain." McLean would leave placenta and drain. Spencer Wells thinks it is safest to leave placenta and drain. Englemann would "probably drain, as removal of placenta can be accomplished only in very favorable cases." Kaltenbach, Gusserow, and Skene would remove placenta in all cases where possible; if not, leave it and drain. Robert Battey says: "Leave placenta undisturbed and use rubber drainage tube." Sutton says: "No hard-and-fast rules can be laid down regarding the treatment of placenta, but officious disturbance of it is to be deprecated, and drainage is imperative." Byford says: "Would attempt to remove placenta in some cases, in others would close and drain if placenta partially detached or removed. If placenta firmly attached and peritoneal membrane in good condition, leave placenta and close without drainage." Goodell would, if possible, remove entire sac; "if this could not be done, should pass cobble stitches through sac, below placenta, and remove the latter. Failing in this I should put in large drainage tube, or else try Tait's latest plan of hermetically closing the wound and treating any collection of pus as an ordinary abscess." Joseph Price would remove placenta in some cases, in others leave it and drain; while in a third group empty it of blood and cut short and stitch sac closely about it. Tait would

"wash out and leave placenta, close sac, and wait for any disturbance that might occur." Lusk thinks the best results have followed the plan of ligation of the large vessels going to sac and removing it entire or in great part, but adds: "No operation is ideal or can be used in all cases."

All agree that the only treatment after rupture of sac into the peritoneum is its prompt removal; and here is an exception to the general rule in surgery not to operate during shock, for our patient is suffering from shock due to hemorrhage, that will increase till the loss is controlled. Where the sac has ruptured down into the ligament, causing a broad ligament hematocele, the case may be watched, and, unless the ligament gives way or extensive extravasation occurs, it may be left to nature or the indications may be met as they arise.

McGannon reports a case seen when in spurious labor at term. As child was dead, immediate operation was not done, and patient did not again come under his care for four months, when he operated successfully. B. F. Baer records a case of intraperitoneal hemorrhage in the fifth week where he operated five weeks later successfully. Shoemaker records three cases: one, operated sixteen days after rupture, recovered; one, operated for acute symptoms referred to tubes, recovered; one, operated after rupture, death from ligation of ureter. W. E. Ashton records a case of primary peritoneal pregnancy successfully treated by laparatomy. Both tubes and ovaries were found absolutely free from adhesions and normal in character. Aust Lawrence teaches that when a previously healthy woman misses one or more periods and is taken with acute abdominal pain and fainting, and these symptoms recur at short intervals, and the vaginal examination reveals a retro-and peri-uterine hematocele, either extending or not up into the abdomen, it is imperative to open that abdomen without delay.

Electricity in Gynecology.—Massey states that only about 8 per cent of fibroids are not benefited by proper electrical treatment. The cases best suited for the method are those that present nodular, interstitial growths of all sizes, and in which the uterine cavity is involved and enlarged. Hemorrhagic complications probably favor ultimate decrease and disappear-

ance, these complications themselves being readily removed. The unfavorable cases are those in which the growths are sub-peritoneal and but slightly connected with the uterus, the tumor being too far removed from the cervical portal of treatment. When very large they may be reached by puncture through the abdominal wall. The œdematous and soft myomata are unsuited to the ordinary mode of applying strong currents, but may be helped and at times greatly reduced by persistent percutaneous treatment, while the degenerating fibro-cystic variety is still regarded by many as contra-indicating electric treatment. Chronic metritis and sub-involution, metrorrhagia and displacements, offer an important field for electricity. The author affirms that chronic inflammatory affections of the adnexa that are unaccompanied by abscess or cystic accumulation are almost invariably amenable to relief and cure by the interpolar action of the galvanic and faradic currents. The results at times are exceedingly striking, the engorgement, hyperplasia, and plastic exudates being dissipated and absorbed. Some old adhesions will remain, it is true, but the active morbid condition from which the patient suffered will be cured. The most obstinate cases are not those in which ovarian and perimetric inflammation predominates, but the tubal cases; yet in these also continued treatment will often achieve complete restoration of health without mutilation or the artificial production of conditions that normally occur in old age. Cases of simple ovaritis attended by ovarian congestion, cases of enlargement and of ovaralgia, are quickly amenable to treatment, the writer having notes of a number of such cases in which this treatment was successful when undertaken after a day had been set for operation. In menorrhalgia due to hyperesthesia of the uterus and adnexa, moderate galvanic currents by the vaginal and uterine method, in accordance with the condition of the endometrium, allay the causative hyperesthesia, stimulate undeveloped organs, and cure associated catarrhal tendencies. About two intermenstrual periods constitute the usual time required. In pelvic neuralgias, neurasthenia, insomnia and hysteria, electricity is very often of great value. Gastro-intestinal torpor, disease of the bladder, neu-

roses of the vulva, amenorrhea, chlorosis, sterility, ectopic gestation, mammary tumors, and carcinoma are also discussed. Burrage describes his methods and states his belief in the great value of the therapeutic application of electricity in pelvic inflammation. Jewett gives a careful description of the methods of application and advantages of the use of "incandescent" current in ordinary gynecological work for faradic, galvanic or cautery effects. Reynolds gives a very clear and simple description of the medical properties of the galvanic and faradic currents, and illustrates by reports of cases.

Endometritis.—Garrigues states that chronic endometritis may be avoided by paying attention to the causes which are known to produce it. Everything that tends to hyperemia of the pelvic organs may lay the foundation of the disease. In this category belongs sexual excitement brought on by prurient novels, by looking at obscene pictures by seeing representations on the stage that aim at the exposure of so much of the body as existing laws and public opinion will permit, by masturbation, sapphism, sodomy, and even normal coition if performed too violently. The excretions should be evacuated with proper intervals. If the bowels do not move by themselves they should be made to do so once in twenty-four hours by enemata or aperients. No regard for so-called propriety should prevent a woman from emptying her bladder at least three times a day, and oftener if a desire to do so is felt. She should be clad in harmony with the season and take care to protect her abdomen against gusts of wind, which find an easy access under her bell-shaped skirt. She should be particularly careful at the time of her menstruation, and not dance, or skate and sit down on the ice, at a time when a process is going on in her body that is so easily turned into an abnormal direction. It is unlikely that the mere frequency of sexual intercourse does a healthy woman any harm, but it is quite different when the natural relations are disturbed. The sin of Onan (which was not masturbation), the use of condoms, injections made in a hurry immediately after ejaculation at a time when nature calls for rest, and often with a liquid of improper temperature, all cause a tension of the nervous system

that in the course of time may lead to chronic endometritis, and should therefore be avoided, independently of all moral, religious or esthetic considerations. In childbirth all antiseptic precautions should be taken to avoid infection, and the afterbirth should be carefully removed. In abortion the uterus should be entirely emptied by removing not only fetus and ovum, but the spongy decidua with the curette. In a patient affected with gonorrhœa of the urethra and the vagina the extension of the disease to the uterus may, perhaps, be prevented by the use of a tampon soaked in a liquid such as this:

Rec. Acidi tannici,
Iodoformi.....*aa* 4 drachm.
Glycerinae.....5 ounces

Under the head of curative treatment he gives a thorough *resume* of the medical and hygienic measures found useful, including electricity and the curette.

Examination of Young Girls.—Coe very properly urges the avoidance of local examination, unless the subjective conditions show it to be absolutely necessary, and then favors the use of anesthesia. He then discusses the necessity for general treatment by electricity, laxatives, iron, general hygienic measures, etc. The rectum is the proper avenue for the examination of the pelvic organs of a virgin.

Morphine in Gynecological Practice.—Hunter Robb, from a study of the evil results following the careless use of morphia and other narcotics, urges that general practitioners, but more particularly specialists, should carefully scrutinize every prescription they write containing morphine, and that under no circumstances should its renewal be allowed unless under their personal supervision; that the patient should never be allowed the use of a hypodermic syringe; that the druggist should be prevented from dispensing morphine without a prescription; that when morphine is prescribed the patient should never be informed of the character of the drug. These remarks apply to all analgesics and sleep producers, particularly chloral, chlorodyne, sulphonal, etc. As substitutes for morphine, he advises, where practicable, electricity; internally, in

guarded doses, gelsemium, phenacetine; and as local applications, the cautery, oil of peppermint, and oil of wintergreen.

Operative Treatment of Retro-Displacements of the Uterus —Frederick holds, first, that retroversions caused by or aggravated by accompanying lacerations of the cervix or perineum should have the lacerations closed to insure relief and reposition; second, a uterus or appendage bound down posteriorly cannot be raised, nor the adhesions broken up manually through the rectum or vagina, unless they be very recent or slight; they must be broken up by laparatomy and the uterus restored and retained in position by some one of the many plans now used; third, no malposition of the uterus needs operative treatment unless it renders the woman sterile or causes her physical suffering or inconvenience. Those whose condition demands relief should be given the benefit of some of these various methods which have been proven safe and efficient.

Pelvic Inflammation.—Fitz states that inflammation may affect the wall or contents of the pelvis; disease of the former usually resulting from the disease of the latter. These inflammations are simple and infective. The former result from traumatic agencies, as a ruptured cyst, a twisted pedicle, a prolonged labor, or a tumor. The latter are septic, gonorrheal, or tubercular. The sepsis results from bacterial invasion under conditions associated with pregnancy and menstruation, or with attempts at diagnosis and treatment, as in the passage of sounds, the use of tents, instruments, and manipulations. The pelvic abscess is usually either a pus tube or a circumscribed peritonitis, the former far more common than the latter, especially in chronic and recurrent cases. Abcesses of the subperitoneal fibrous tissues of the pelvis may occur, usually proceeding from the uterus of a suppurative parametritis, and rarely attain a size to be confounded with the previous varieties. Both the simple and infective forms of pelvic inflammation may result in adhesions—chronic adhesive peritonitis—and in thickenings of the parametrium—chronic parametritis. The former are the chief causes of uterine displacements; the latter are less frequent, and are usually so situated as to produce but little mechanical disturbance. Simple forms of pelvic inflammation are

frequently unavoidable, and, as a rule, require simple treatment, this chiefly medical; infective forms of pelvic inflammation are largely avoidable, immediately or remotely injurious or dangerous to life and well-being, and generally demand treatment by surgical methods. Dixon Jones gives a detailed description with drawings of the microscopic changes in the histological elements of the inflamed peritoneum. In concluding he says: "So far as is at present known, the most frequent pyogenic germs of peritonitis are gonococci." "I believe gonorrheal infection is one of the most frequent causes of disease of the uterine appendages, and of inflammation and suppurations of the peritoneum. Nature, for temporary protection, may seal up the fimbriated extremity, but there is constant danger, and the pus tubes may at any time produce a rapidly fatal peritonitis. The fearful consequences of these diseases, whether produced by gonorrheal infection or from the introduction in various ways of staphylococci or streptococci, should urge us to consider some mode of protection. No disease is more serious in its possible results. No greater calamity can happen to a woman. It blights forever her dearest hopes, cruelly darkens many of her brightest visions, and destroys for ever the organs that make her a woman and by which she may become a mother. The removal of diseased uterine appendages by surgery is only to save her from more serious possibilities. With or without the operation she is in danger." McMaster urges the necessity for careful treatment of the accompanying endometritis by sharp curette, pure phenol, and sodium gauze. Cabot says that a localized pelvic abscess which is easily felt from the vagina, should be opened from below. When, on the other hand, the induration and hardness does not come down into close contact with the vagina; but where the fallopian tubes can be made out as sausage-like swellings high up in the pelvis, we have a condition in which laparatomy is demanded. Between these two extremes the judgment of the surgeon, guided by careful examination, must determine whether the pus in a given case is readily accesssible from the vagina, or whether the chance of being able to thoroughly remove the pus cavity makes it wiser to approach the case from above.

Puerperal Sepsis—Davis suggests as rational treatment in puerperal sepsis: Thorough disinfection of all puerperal ulcers with four vaginal douches of bichloride of murcury solution 1–4,000 in twenty-four hours, accompanied by purgation with salines; turpentine stupes may be used to relieve abdominal pain. If fever and foul lochia are present the uterus should be curetted and thoroughly douched and tamponed with iodoform gauze, or sixty grains of iodoform in a suppository placed within its cavity. Intra-uterine douches should be continued at intervals for not longer than forty-eight hours. If no improvement follows, the patient should be placed in Trendelenburg's posture, the abdomen opened, the pelvic organs inspected, foci of suppuration so discovered extirpated, or, if the general pertitoneal cavity has begun to be involved, free irrigation should be practiced. A difficult point to be determined, and one whose discussion cannot fail to be of value, is the question, What indications justify the opening of the abdomen and the practice of radical interference? Mays would submit the uterus then to the same surgical treatment that you would any septic cavity. Curette fearlessly the interior until certain that nothing detachable can possibly be left behind. Then flush the cavity with a stream of hot water through a bulb syringe, and inject four ounces of peroxide of hydrogen before withdrawing the tube. Repeat this flushing process twice daily. The medical treatment consists of strychnine, a thirtieth of a grain twice a day, and alcoholics, avoiding opium as far as possible. The best antipyretic is a five grain powder of acetanilid.

Relation between Menstruation and Impregnation.—Milne Murray cites a case where insemination occurred a few hours before menstruation began and was followed by pregnancy and delivery two hundred and seventy-two days later. The menstrual period was perfectly normal and no subsequent coitus occurred. This case is of interest in indicating that the process of menstruation does not apparently interfere with the passage of the spermatozoa along the uterine cavity. Unless we claim a rate of travel for the spermatozoa much greater than is ordinarily admitted, they must have been caught in the menstrual discharge which began to flow within an hour or two after they were thrown

into the vagina. In spite of this, however, they must have made their way against the downward current of the menstrual blood, and have reached the fallopian tube in good time to fertilize the ovum discharge. This fact seems to tell somewhat against the view held by Tait that fertilization normally takes place in the uterus, and that the cilia of the tube are there as a safeguard to prevent the spermatozoa entering the tube. According to this view, it is only in diseased tubes where the cilia are absent or ineffective, that the spermatozoa enter the tube, the current set up by healthy cilia being in all cases sufficient to prevent their ingress. It seems, however, that if spermatozoa can make their way against a free menstrual discharge, the ciliary current of the fallopian tube need give them little trouble. In connection with this matter Duncan points out that where a fertilizing insemination takes place just before the period is due the latter frequently "does not take place at all, or only very scantily; the uterine system as it were, anticipating the conception and preventing the failure which might result from a free discharge of blood." It is evident that such cases occurring in married women would be very liable to be considered "cases of gestation protracted a month." In the case referred to here the period was a perfectly natural one, in no respect differing from any of those which had immediately preceded it.

Salpingitis.—Strong advocates the treatment of salpingitis by dilation and drainage in a way very similar to that so strongly urged by Polk: "The aim should be to render the operation thoroughly aseptic, operating with the patient upon the side in the Sims position, avoiding any downward traction of the uterus, by which the tubes might be put upon the stretch, and possibly a portion of their contents forced out upon the peritoneum; the cardinal point in the whole operation being to avoid lighting up fresh salpingitis or peritonitis by mechanical violence. Dilate slowly and steadily with steel forceps until the canal will readily admit a No. 36 sound. Thoroughly scrape away by sharp curette and curette forceps the entire uterine mucous membrane both cervical and fundal; especially endeavoring to free the opening at the uterine end of the tube, it being at this point that they are frequently occluded by a slight

hyperplastic enlargement. Disinfect the uterine cavity. Insert a twisted roll of iodoform gauze, about the size of a goose quill, to the fundus. Along side of this roll insert others until the cervical canal is firmly filled. Leave the protruding ends within the vagina, and protect the vulva by an antiseptic pad. Change these rolls of gauze every two or three days for ten days, and keep the patient in bed a week. The time of election for the operation is one week subsequent to the menstrual flow. Examine under ether, after a month has gone by, and if there is still evidence of salpingitis or endometritis, repeat the treatment. Should the tubes be enlarged when the uterine interior shows no evidence of disease either by muco-purulent discharge or hyperplasia, do not operate, but rely upon douches and alterative applications to the vaginal vault to effect reduction in their size, which may, very possibly, be due to the results of the peritoneal inflammation rather than to any increase in the contents of the tube. Success depends upon a proper appreciation of the pathological conditions which are to be relieved. Acute cases are best treated, for a time at least, by palliative measures or by radical operation. Chronic cases in which the tubes are tied down by many adhesions,and in which the symptoms are dependent upon immobility of the tubes or of the uterus, do not afford a hopeful prospect of cure. In all other forms I consider the operation not dangerons, and capable of accomplishing far more in the way of radical cure than any of the absolutely palliative measures, and, of course, free from the one great objection of a radical operation. The symptoms are indicative, in a measure, of what you may expect to find by examination. Pain, which is the constant and prominent symptom, is usually constantly present in those cases where peritoneal adhesions are thick and strong. These are not promising cases. The duration of the disease is also of importance. Those of more recent origin, other points being equal, yield more readily. Mobility of the tubes and patency of the uterine end of the canal are absolutely essential. It will be noticed that none of my cases have been cured by a single treatment. I think this is due to the practical difficulty of removing entirely the affected uterine mucous membrane. Whether a long period

of drainage will accomplish this I am unable to say. I have made it a rule to limit my drainage to eight or ten days."

This latter class of cases yield to the galvanic treatment.

Septic Infection of the Uterine Mucosa.—Charles W. Adams holds that the following propositions form a true conservative basis of gynesic surgery in these conditions: 1. The endometrium and musculature of the uterus, as well as its adnexa, is richly supplied with lymph vessels, which, like its arteries and veins, form vast spread-out plexuses, freely anastomosing with each other. 2. The lymphatics of the uterus and its adnexa freely communicate with the peritoneum by means of open orifices or mouths. 3. Septic conditions of the uterine mucosa have three channels of reaching the peritoneum, viz, (1) the fallopian tubes, (2) the lymphatics, (3) the veins. 4. The first, as a rule, are nearly closed by plastic inflammation of the fimbriated extremity of the tubes. The veins only play a part during the puerperal period. The lymphatics alone remain open and are constant carriers of infection. 5. Diseased tubes, peritonitis, and cellulitis causing abscess, agglutination, distortions and bands of adhesions in the female pelvis, are rarely, if ever, idiopathetic, but always secondary to infection from the uterus. 6. When infection from the uterus has already brought about pathological changes, the diseased uterus and its membranes must first be cured before the removal of the appendages be attempted. 7. The removal of disease from the uterus and its membrane, by removing the only source of infection, will also frequently allow of the removal of the effects of infection by appropriate treatment without operation. 8. The failure of treatment in removing products of inflammation in the female pelvis depends often upon a non-recognition of the above proposition. 9. When there is no constant renewal of an infection the primal physiological action of a lymph membrane is to remove the products of an inflammation, if placed in a favorable condition before organization takes place. This is especially true in the female pelvic cavity. 10. The properly directed means for curing an infective endometritis will in some cases, cure a sacculation of pus or fluid within a closed fallopian tube by opening the closed uterine orifice, thus

giving drainage and ultimate cure.

The above abstract has been taken from the November number, 1892, of the *American Journal of Obstetrics*, to which standard and unexcelled publication I take profound pleasure in giving credit, and to the opinions and teachings herein set forth I most heartily subscribe. My apology for presenting this abstract is, that it is far more instructive as a consensus of views in gynecology to date, than any original work of my own could hope to offer you, and in this form may attract further and more critical attention from our members.

SECONDARY POST PARTUM HEMORRHAGE.

By John T. Davison, M.D., Denver.

The occurrence of secondary post-partum hemorrhage is an event of relative infrequency, therefore in the case to be related may be found something of interest to be added to the knowledge we possess upon the subject.

Mrs. G., aged 29, American, primipara, miner's wife, was delivered of twins at about the eighth month of pregnancy, August 2, 1889. She was attended in her confinement by a mid-wife. Of the children, both of whom were syphilitic in appearance, one died twenty-eight hours after birth, the other ninteen days after delivery. The mother was up attending to her by no means light household duties five days after confinement. She attended the funeral of the second child, riding some miles in an open wagon. August 23, or three weeks after delivery, she sent for me in haste. Upon arrival she was found lying upon the bed, quite pale and anxious. Her clothing and the bedding underneath thoroughly saturated with blood. There was not even hot water in the house and no attendant save a neighbor who had chanced in.

Bimanual examination showed the uterus well contracted, of the usual size for the period elapsing after delivery, and

occupying the natural position. Introducing a duck-bill speculum, blood was seen issuing freely from the os. At this juncture the patient became quite blanched, sweat appearing on the forehead and the pupils dilating. The emergency being pressing, the vagina was tamponed with the first accessible substance, a new, clean, sheeps-wool sponge of about two ounces in weight. This was torn into shreds, soaked in a one to six solution perchloride iron and introduced until the introitus was reached. Notwithstanding this, considerable oozing from the orifice took place. This was considered later when time was given for thought, to be due to the patient's previously anæmic condition, or, possibly to a hæmophilic tendency. The oozing continued for about an hour, finally ceasing. Fluid extract of ergot in one dram doses was given every four hours for a few days, quinine, iron and a liberal diet prescribed, caution enjoined as to the use of hot liquids, and small quantities of stimulants allowed. The tampon was removed thirty-six hours after insertion, vaginal irrigations of bichloride mercury 1–3000 and carbolic acid 1–50 (to destroy fetor) used, and tamponing with absorbent cotton and irrigations continued daily for about one week, then discontinued. She concluded September 1st, or nine days after the first profuse hemorrhage, to sit upon a chair, when a second, but slighter hemorrhage took place. Tamponing again resorted to with success as far as immediate control of hemorrhage was concerned, but any attempt to discontinue their use was followed, on slight exertion, by hemorrhage so that the use of tampons was continued daily for some weeks. An inspection of the os was made previous to the insertion of the tampons and a bad laceration discovered, but any attempt to ascertain the precise location of the torn artery resulted in such an amount of blood being lost, that further investigation was abandoned and reliance placed solely in the tampons. By this means the hemorrhage was finally stopped.

Four weeks perhaps after the first hemorrhage, a semi-globular body was observed protruding at the os externum. This suggested partial inversion of the uterus, or a polypus. Disappearing spontaneously after some weeks, it verified the former supposition. During the continuance of treatment Dr. A. A.

White, of Trinidad, and Dr. J. B. Hannah, of Sopris, were at times in consultation and during a part of the time, while I was absent, in charge. The patient's general health and strength, under reconstituent treatment, rest in bed and liberal nourishment, gradually improved and she was able to get up, finally recovering fully and gaining many pounds in weight. About sixteen months from her first confinement I attended her in labor, delivering her of a large male child. The cervical scar could be easily felt by the examining finger. incidentally verifying the diagnosis of hemorrhage due to lacerated cervical artery.

The point of special interest about this case was the occurrence of hemorrhage so many days after delivery when it might be supposed that all danger from this cause had passed. Playfair divides the causes of secondary *post partum* hemorrhages into two classes, due to constitutional and local conditions. Of the first class are included cases due to disturbances of the vascular system of the body generally, or of the uterine vessels in particular. The slight barrier afforded to the escape of blood from the uterine sinuses shortly after delivery, may be broken down by a variety of causes, such as mental emotions, the sudden assumption of the erect posture, any undue exertion, the incautious use of stimulants, a loaded condition of the bowels, or, sexual intercourse shortly after delivery. Playfair quotes Blot as mentioning albuminuria as a constitutional cause,and Saboia, of Brazil, that a common symptom of miasmatic poisoning is the occurrence of secondary hemorrhage. To these I would add that the existence of any cachexia resulting in marked anæmia should be considered a predisposing cause of secondary *post partum* hemorrhage, as it would be considered a factor in the occurrence of primary *post partum* hemorrhage, *i. e.*, the hemorrhage occuring just after delivery. The local causes, using Playfair's classification, fall into eight classes:

1. Irregular and inefficient contraction of the uterus.
2. Clots in the uterine cavity.
3. Portions of retained placenta or membranes.
4. Retroflexion of the uterus.
5. Laceration, or inflammatory state of the cervix.

6. Thrombosis or hematocele of the cervix or vulva.
7. Inversion of the uterus.
8. Fibroid tumors or polypus of the uterus.

The mere enumeration of these suggests in most cases the remedy. This case of mine, falling under classes 5 and 7 may merit a brief *resume* of the treatment appropriate to such cases. If we are so situated that with skilled assistants at hand and the diagnosis certain, we may control the hemorrhage by including the cervical artery with its adjoining tissues within the loop of a silver wire suture, as is now done by some obstetricians after the manner of Pallen, but, when alone, with rapid hemorrhage alarming in its nature, it is satisfactory to know that with tamponing, with or without a styptic, temporary control of the hemorrhage is secured. A treatment also, which if persisted in may become the means of permanent cure. The case illustrates a very probable spontaneous reposition of a partially inverted uterus.

In conclusion it should be borne in mind, as stated by Lusk, that a *post-partum* hemorrhage is not always to be looked for as coming from the uterus, cervix or vagina, but may be due to a laceration of the vestibule; hence, in any obscure case inspection of this portion of the vulva should be included as a part of the examination.

DISTOCIA FROM CONTRACTED PELVIS.

By T. E. Taylor, M D., Denver.

We are apt to look upon distocia from the above cause as something which concerns chiefly the old countries, and attribute our own difficult labors to inefficient pains, etc., which we deem more characteristic of American women; but if we would more carefully measure the pelvis in these cases, we should be surprised to see how often a greater or less degree of contraction

of the pelvis in some of its diameters was present, pelvic measurements being very seldom taken in this country.

In my service at the Arapahoe County Hospital, where we measure the pelvis in all cases soon after admission, we find 15 per cent somewhat contracted, and by this means have early knowledge of those who are likely to experience difficulty. As a matter of routine, we do not take all the pelvic measurements as it has been shown that if the external conjugate, and the distances between the anterior superior spines and crests of the ilium at their widest point are normal, the true conjugate may be confidently expected to be normal also. If, however, these measurements are abnormal, the diagonal conjugate is sought, and from this an estimate of the true conjugate is made.

As was shown by Dr. Pershing, in his valuable article in the *American Journal of Medical Sciences*, February, 1889, it is not so much the actual distance between spines or crests that must be considered, as the relation between them. Thus if the distance between the crests is normal, but the distance between the spines is still greater, we have reason to suspect some flattening of the pelvis. If this is considerable in degree, there is usually some diminution of the external conjugate, though not much dependence can be placed upon this, as the external conjugate varies widely in normal cases. Only where there seems to be reason to suspect narrowing of the pelvis is a vaginal examination made to determine the value of the diagonal conjugate. In normal cases this can only be measured with great difficulty, especially in a primipara, but where there is much flattening it is not difficult to reach in any case. Having the hips slightly elevated, on some firm support, with the thighs flexed, the index and middle fingers should be introduced into the vagina and passed up into the posterior vaginal *cul de sac*, when by crowding the perineum firmly backward and upward, the promontory of the sacrum can usually be touched by the middle finger; keeping the tip of the finger against this prominence, the hand is brought forward until it is stopped by the sub-pubic ligament, and the point where it is crossed by the sub-pubic ligament is carefully marked with the other hand and the distance from this point to the tip of the finger which

touched the promontory carefully noted. This is the diagonal conjugate. From this the true conjugate is obtained by subtracting about three-fourths of an inch, the amount to be subtracted varying somewhat with the height of the symphysis and its inclination.

The most common forms of pelvic deformity in this country are the flat pelvis, the generally contracted pelvis and the combination of these two forms giving us the generally contracted flat pelvis. The obliquely distorted pelvis is not uncommon in Europe, but is practically unknown here. An account of one of the cases of pelvic contraction discovered by this system of routine measurements may not be uninteresting in this connection.

Miss S. a young colored girl, aged 14, was admitted to the hospital in the latter half of February, 1893. She stated that she had menstruated last some time in June, and that she had felt foetal motion sometime in October but could remember nothing definite. We accordingly anticipated labor sometime from the 15th to 30th of March. Upon measuring the pelvis the following were found to be its dimensions:

Distance between ant. sup. sp.	$10\frac{1}{8}$ inch.
" " crests of ilium	$9\frac{3}{4}$ inch.
External conjugate	$7\frac{1}{4}$ inch.
Diagonal	$3\frac{7}{8}$ inch.
True conjugate (estimated)	$3\frac{1}{8}$ inch.

These measurements indicated a generally contracted flattened pelvis, and the degree of contraction was so great as to render it doubtful if a head of normal size could be drawn through it safely. My colleague. Dr. A. K. Worthington, was therefore called in consultation, and having verified my measurements he agreed with me that labor should be induced. Accordingly on March 2nd the vagina was douched with a bichloride solution and an elastic bougie was introduced between the membranes and uterus to the fundus. March 4th labor came on, the pains being rather frequent and weak. By noon of March 5th the os was well dilated and the membranes ruptured. As the head did not engage and the pains were becoming weaker, it seemed useless to delay interference, and as

the labor was believed to be somewhat premature, it was thought possible that the head might be drawn down. The forceps being applied strong traction was required to make the head engage in the brim, and throughout the whole course till it emerged from the outlet my whole strength was exerted, with intermissions, with feet braced against the bed. Delivery was completed in thirty minutes.

The child at birth was asphyxiated, but was successfully resuscitated. Deep grooves on the sides of the face and head showed how forcibly they had been compressed by the blades. As to the mother, of course there must have been considerable bruising of the soft parts, but the temperature only twice reached 102 and the tenderness over uterus was not great.

The child was apparently well developed, having a plentiful supply of hair and hardened nails, was eighteen and one-half inches long and weighed five and one-half pounds, being rather light in proportion to the size of the head, as it was rather thin in flesh.

Four days after birth, when the head had recovered its shape, I obtained the following measurements:

Occipito-mental, diameter.	$5\frac{1}{4}$ inch.
Occipito-frontal, "	$4\frac{3}{4}$ inch.
Suboccipito-bregmatic,	$3\frac{3}{4}$ inch.
Biparietal,	$3\frac{3}{4}$ inch.

From this it will be seen that the head was of the ordinary size, and as there were no indications of immaturity, it must have nearly arrived at full term.

In the treatment of these forms of distortion, great progress has been made in the last few years, largely in consequence of the more frequent measurements of the pelvis, and consequent early recognition of the nature and extent of the deformity. Not many years ago, when the head refused to descend under the influence of strong pains, the general practice was to apply forceps or perform version, if these failed, to resort to craniotomy or cephalotripsy, occasionally, in a desperate case doing a Cæsarean section. Now, knowing pretty accurately the dimensions of the pelvis, we can select the procedure best adapted to the case in hand, and can therefore spare the

patient the perils of two or more different operations. The recent revival and improvement of symphysiotomy promises to be of immense value in these cases, where the contraction is moderate in extent. By it, a separation of the pelvic bones at the symphysis amounting to 2½ inches may usually be obtained with an increase of over half an inch in the true conjugate and an even greater gain in the transverse diameter. If asepsis is maintained, and the parts brought accurately together, firm union may be confidently expected and no difficulty in walking will be experienced as so often happened formerly.

Where the degree of contraction is so great as in the case above described, I believe we would get better results in a series of cases by at once performing symphysiotomy, as forceps delivery generally fails or at best seriously endangers both mother and child; and after it has been attempted without success, the outlook for a symphysiotomy is much less favorable. If the contraction of the pelvis is detected a month or two before full term, an induced premature labor may make an operation unnecessary, even though the true conjugate is much below 3¼, and by a combination of induced labor and symphysiotomy the birth of an unmutilated child may be possible when the true conjugate is as low as 2½ inches. (Novi advocates this proceedure when the true conjugate is only 2.1-6 inches.) With a flatter pelvis than this, the improved Cæsarean section is scarcely more dangerous to the mother than craniotomy, and is therefore usually to be preferred as saving the life of the child. It seems that the time is at hand when the long tolerated slaughter of the innocent will scarcely be thought of.

DISCUSSION.

Dr. Grissom. I would like to make a single observation. If I do not misunderstand the doctor in his very excellent paper, it seems to me that he would give preference to the life of the infant instead of the mother. If that be true, I should not be able to agree with him. If an issue of that sort should present itself to me, I should be decidedly opposed under any and all circumstances to give preference to the life of the infant.

Dr. Taylor. I did not mean to give preference to the

child. I just meant to give the child a little chance. As I stated in cases where the contraction is not very extreme, I would resort to induced labor, combined, if necessary, with symphysiotomy; but in those cases where the defect is very extreme, I would favor Cæsarean section; since we know that in these cases craniotomy is exceedingly dangerous to the mother. As I said, the patient has scarcely more danger in one than the other. At the hands of skilled operators eighty per cent of cases of Cæsarean section recover. And you can scarcely get better results than that from craniotomy in cases of extreme contraction.

If one proceedure saves the life of the child and mother, and the other sacrifices the child, I think we are bound to choose the former.

ESSENTIAL DETAILS IN THE CONDUCT OF LABOR.

By Kate Reynolds Lobingier, M.D., Denver.

Obstetrics is a branch of surgery, and surgery is a science of the most tedious detail. No surgeon is really safe who does not pay attention to minutiæ. The lying-in woman is a surgical patient, for she has been wounded. The site of the placenta is a large, open wound, and there is generally traumatism of the cervix, and often of the vagina and perineum. Dr. Houghton thinks the proper duration of the lying-in period can not be decided except from a surgical standpoint. He allows two weeks for surgical rest in bed, one week for passive motion which consists of changing from the bed to the arm chair or lounge, and moving gently about the room. The strained ligaments and other supporting structures of the pelvis now need moderate activity for their development. The fourth week is devoted to general nutrition by means of exercise, sunlight and fresh air.

If we grant that an obstetrical patient is a surgical one, attention to detail will assume the important place it should occupy. Nothing that reduces the risks of the child-bearing woman can be considered trivial.

Since labor is a natural event, there seems to exist a feeling that Providence is bound to look out for the patient. When Semmelweiss began his observations in the Vienna Hospital in 1846, women were dying of septic fever at the rate of one in six of those confined, and Providence did not interfere. If nature had a chance she would do very well, but she is not always capable of managing a patient previously poisoned by man. Semmelweiss believed that every effect had a cause. He observed that the death rate was much lower in a new ward than in the old. He could not believe this was the result of accident, and he tried all kinds of experiments to discover the real cause of the difference. When a professor died of a dissecting wound, he received a useful hint. Later. a pregnant woman, suffering from cancer, was examined in the clinic, and twelve other pregnant women were examined after her; eleven of these patients died with puerperal fever. This remarkable series of cases made the truth evident, and Semmelweiss straightway issued a set of the most stringent rules. The adoption of the precautions he insisted upon caused the death rate in the old ward to fall at once.

The talk about Providence has been a great obstacle in the way of scientific advance in obstetrics. Four years before Semmelweiss issued his rules at Vienna, Oliver Wendell Holmes in America wrote a paper on puerperal fever which aroused most bitter prejudice. These are the facts that called forth the essay. A certain patient died of what we now call septicæmia. The doctor, who did the *post mortem* pricked his finger, and soon after attended several women in labor. They all had septic fever and at the end of a week, the doctor himself died of blood poisoning. It was easy to account for the illness of the women on the score of Providence, but the death of the doctor was a different matter. For this there must be a cause, and the affair must be investigated. Dr. Holmes had, of course, only the vaguest idea of the under-lying truth. He had no concep-

tion of the bacteria which Pasteur has since isolated, yet he claims, and rightly, that when facts are unquestionable, theory must follow, keeping time as it best may.

The essay of Dr. Holmes startled the world, partly because the truth was startling, but also because it was expressed in such vigorous, pungent English. The laity could understand both his science and his logic. He asserted that the physicians and the disease often entered hand in hand into the sick room, and he closes with these words: "The pestilence carrier of the lying in chamber must look to God for pardon, for man will never forgive him". The statements in the essay were expressed so picturesquely and forcibly that they stung. Of course, his facts were disagreeable and inconvenient, but it seems impossible that a man like Dr. Meigs, of Philadelphia, could say in defense of the physicians that, when one man had seventy cases of puerperal fever in less than one year, it could be explained, on the ground of his having a large practice, and thus seeing more bad cases. He says, "I prefer to attribute these cases to accident, or Providence, of which I can form a conception, rather than to a contagion, of which I cannot form any clear idea". These words sound like the echo of centuries past, but they were written only forty years ago. Busy bacteria have so little reverence for the learning of a college professor, that they continued to thrive and multiply, in spite of such discouraging sentiments.

A great deal of personal abuse was heaped on Dr. Holmes because of this essay which claimed that puerperal fever was contagious. In answer he says, "I take no offense, and attempt no retort. No man makes a quarrel with me over the counterpane that covers a mother with her new-born infant at her breast"; and he adds, "I am too much in earnest for either humility or vanity." These well known words are quoted because they express so clearly the proper spirit of the conscientious obstetrician.

Dr. Holmes advised the physician to stop practice for a month, if he had two cases of puerperal fever, one closely following the other. If there were three cases in succession, the attendant must surely consider himself the cause of the conta-

gion. Dr. Holmes mentions the case of a doctor who did a *post mortem* on a patient, dead of puerperal fever, and took the pelvic viscera out, put them in the pocket of his coat, carried them to the class room and handled them there, immediately after going to a labor case wearing the same clothes. I believe he left the viscera outside the lying-in chamber, but he might as well have kept them in his pocket, for the woman died, anyway. It makes one shudder to think of the needless dangers to which women used to be so carelessly exposed.

The lowering of the death rate in obstetrical cases has been making steady progress of late. Forty years ago, the average death rate in maternity hospitals was one in ten. In the London Maternity, at one time, forty per cent had septic fever, though the death rate was not above the average. The excuse given for the occurrence of so much fever was that the patients of the lower class were not clean; they had low morals and little intelligence, and only the most difficult cases were sent to the hospital. The fallacy of such reasoning is shown by present statistics. The women admitted to the Sloane Maternity in New York City are a low class. Their faces seem quite out of harmony with the purity of their surroundings in the hospital; but in the first thousand cases there was only one death from sepsis, and that patient was septic when she entered. In 1883 the death rate at the New York Maternity was high. There were nine deaths in one month. Dr. Garrigues felt it necessary to adopt the most elaborate precautions, and by doing so he reduced the death rate from nearly seven per cent to less than one per cent. From sepsis it was only four-tenths of one per cent. At the Preston Retreat in Philadelphia there have been a thousand cases with no deaths at all. There is some difference between these statistics and those when sixteen per cent of the women were dying in the Vienna Hospital.

It really seems as if the time might come when the physiological function of labor would be no more dangerous than is digestion. But this must be impossible,until the methods used in private practice are greatly improved. Hospital cases receive the most scrupulous and elaborate attention, but private patients are often neglected. The laity seem to think that any

person of ordinary common sense can manage a normal labor case. In New York city, any cook who gets tired of the kitchen, may register her name, pay fifty cents and become a midwife. A physician pithily says that, "if the men who make the laws had to bear the children, there would be better protection for the child and its parent." One-half the births in New York city are attended by midwives. In Brooklyn two-thirds of the still-births occur in the practice of these *sages femmes*. Schatz says that often these women are not capable; but they are lazy and do not examine. A perfectly normal case does fairly well under them, but the inaction which preserves the mother from the danger of an unclean finger, is disastrous to the child.

Even physicians seem imbued with the popular fallacy that a normal labor case requires no special attention or forethought. So many times a doctor has taken chances and not suffered thereby, that any extra precautions seem needless. The attendant may neglect to examine the urine in ninety-nine cases of pregnacy and no harm result, but in the one-hundredth case neglect may give rise to well-founded regret.

Dr Smyly of the Rotunda Hospital, Dublin, says: "Septic infection is believed to be uncommon in private practice. This is a dangerous mistake. The same precautions are as absolutely necessary as in hospitals." But how to carry out sanitary measures in an ordinary home is the question. The practical application of well-known principles is difficult, because we meet with so many varying circumstances, and so much obstinacy and indifference on the part of nurses who have not been trained, and so many patients themselves are entirely ignorant of sanitary laws. If the attendant does not see the patient until she is in labor, the conditions are only to a limited degree under his control; but if he makes a visit during the last two weeks of pregnancy, a great deal may be accomplished in the way of effective sanitary precautions. This visit prior to labor is the most important one the physician makes.

He should indicate, at this time, what he thinks the most suitable room for a confinement. Sunlight is a great germicide, and a dark room is sure to be dusty. There should be no carpet on the floor of the confinement room. Most women

can easily be induced to have some house-cleaning done. When the carpet is once removed it need not be replaced till after the labor. Rugs or pieces of carpet can be thrown down, and these can be taken out of the sick room to be cleaned of dust. Matting and linoleum are not objectionable, because they can be wiped off with a damp cloth. The patient should have this maxim impressed upon her: "Dust is dangerous."

The bed should be metal, iron or brass. A suggestion to this effect may avail for another labor, if not for this. The iron hospital cot is not expensive and is well adapted for confinement cases. A wide, low, sagging bed has many objections. It is always a difficult point to decide about the mattress. Of course feathers are uot to be endured, and a bed of this kind should be removed as soon as discovered. A patient of mine argued that because she had already had two children on a certain feather-bed, that was sufficient reason why that particular bed, and no other, should be used for her third labor. The old-fashioned straw-bed, with fresh straw and newly washed ticking, was sweet and wholesome; but if this cannot be obtained a new mattress of husk or excelsior will answer as well. At least, the mattress should either be new or freshly cleaned, no matter what the kind. Particular inquiry should be made with reference to shoddy wool. In doubtful cases it is well to rip the mattress open to see if the interior is honest. If the patient is impressed with the fact that shoddy woolen rags may have come from the pest-house, she will be more likely to take pains to procure a more suitable bed for her confinement. The mackintosh that is to cover the mattress and also the one used under the hips, should be thoroughly scrubbed and disinfected. Nothing should be used on the bed that has not been freshly washed and sunned. Old comforts are an abomination, but new comforts made of cheese cloth and white rose cotton are allowable. These are light, soft and agreeable, while heavy bedding tends to make the aching patient restless and feverish.

It would be well if the room could be cleaned and the bed prepared, and neither be used again until the onset of labor. Of course the room must be aired and sunned every day so as to be fresh and sweet for the use of the patient. If it is necessary

to use the chamber every night, an iron hospital cot should stand in the room ready prepared for the labor and the patient can be quickly transferred to this from the bed in which she has been sleeping.

During the confinement ordinary cotton sheets may be placed under the patient's hips in order to protect the bedding from discharges, but a regular accouchment sheet of wood wool is much better. These thick, soft sheets absorb liquids well and are said to be sterile, as they have been treated with corrosive sublimate. The patient could prepare a similar one herself by using borated absorbent cotton and boiled cheese cloth. Wood wool pads to receive the lochia can be purchased ready prepared, but ones that answer very well may be manufactured at home. Ordinary cotton can be used if it is baked well, and covered with the cheese cloth. Only the softest material should be used; the parts are so swollen and tender that ordinary cloth is much too harsh.

The patient should see to it that her nurse wears a clean cotton dress. A perfectly new nail brush should be provided for the use of the physician during labor, and for the nurse to use afterward in scrubbing her own hands and those of the patient. A new fountain syringe is a necessity. Cases of infection have been traced to the use of the neighborhood syringe. Every physician must be prepared to give a hot uterine douche; in case of sudden hemorrhage when the cervix is slow in dilating, the vaginal douche is a valuable aid in relaxing the parts. If the reservoir were made of agate ware it would be better, but new rubber thoroughly disinfected with boiling water before use, will generally answer. If there is not already a large earthen bed-pan in the house, one should be procured. It is desirable that every patient should buy her own catheter. She will generally be willing to incur the trifling expense, if she understands that in some cases labor may be shortened by the use of this instrument. It is hardly prudent to leave a newly delivered woman without a catheter in the house, and if the nurse must use it, it is far safer that she have a new instrument.

A bottle of carbolic acid should be bought and an ounce or two of pure glycerine. Carbolized glycerine, three per cent. is

necessary as a lubricant for the fingers, the nozzle of the syringe, the catheter and the forceps. It is not often we have a hemorrhage that can not be controlled by the hand, hot water and ergot; but sterilized vinegar and borated cotton should be provided, in case it is necessary to swab out the uterus with an astringent. It is well to have ice and lemons also. Water should be boiled and put into large bottles with cotton corks, for it may be necessary to lower the temperature of a douche very quickly.

The patient should be directed when labor begins, to have the pubic hair closely cut, and then the whole genital region should be washed with soap and water and afterward bathed with some antiseptic solution. An enema should be given in every case, so as to clear the rectum as completety as possible of any offending material. Long clean leggins of gauze underwear, and over them clean stockings, should be put on in order to avoid any chill from exposure.

Inquiry should be made at the visit prior to labor, if there is a comfortable sitz-bath tub in the house. Nothing is more effectual in relieving the piercing pains of cervical dilatation than sitting in hot water. Most sitz-tubs to be obtained are constructed without any regard to comfort. The back should be high, the front low and the interior roomy, so the woman in labor can sit comfortably, with her head supported and her feet touching the floor. The use of the sitz-tub should begin in the early months of pregnancy. It insures local cleanliness and prevents pruritus, relieves aching, aids sleep and is a general nerve sedative. The bath should be followed by a thorough rubbing of the abdomen with cocoanut oil which penetrates so readily that the skin is kept soft and flexible and the clothing is not soiled. For several weeks before labor the perineal region should be kept oiled and soft.

Most authorities agree that it is advisable to make a pelvic examination before labor begins. A pelvimeter is a very convenient instrument, but much may be learned about the size of the pelvis by the use of the hand alone. By sweeping the finger around the bony rim an idea can be obtained about the size of the superior strait, and the sacro sub-pubic diameter

can be measured directly on the hand. It is important to notice whether the pubic arch is normally wide and open, or if it is narrow and approaches the male type.

In most cases the presentation of the foetus is easily determined by abdominal palpation before labor begins. The patient generally dislikes manipulation of the external surface when she is actually in labor, but beforehand she usually makes no objection. By pressing in deeply above the os pubis the round cannon-ball head can be grasped between the hands. By arching both hands over the upper extremity of the fundus the rounded breech can be felt. Placing one hand on each side of the abdomen the continuous outline of the back will be noticed, generally on the right side, and the small irregular parts on the left. The patient will often aid the diagnosis by saying the motion is constantly on the left side.

By putting one hand on the breach and the finger of the other internally on the head, the foetus can be moved between the hands and its position very well appreciated. This conjoined manipulation is very satisfactory and can easily be done while the finger is exploring the pelvis. If a breech presentation is discovered, it can be rectified, or if that is not done, at least the attendant is forewarned and thus may be forearmed.

The abdomen should be measured. The normal size is thirty-nine inches at term. Any great increase of this measurement would have a significance in reference to the amount of amniotic fluid and the presence of twins.

The sound of the foetal heart-beat is generally very distinct in the latter part of pregnancy. Failure to hear it would point to something abnormal. Positive evidence is most satisfactory, but negative evidence is not without value.

It is hardly necessary to state that an examination of the urine should be made and if albumenuria exits, special attention should be directed to the kidneys.

If the visit and examination prior to labor have been made, the attendant will have little care at the actual onset of labor. His ordinary dusty clothing should not be worn. A short white coat and white apron are most convenient, but a surgical gown can be improvised out of a sheet. The hands

and arms should be scrubbed with ethereal soap. A new nail brush should be used and the nails carefully cleaned with a knife or metal nail-cleaner. A solution of bichloride, one to one thousand should be prepared. It is well to drop into this a tablet of permanganate of potash, for the red color prevents mistakes.

Before a vaginal examination is made the hand should be held in the bichloride one minute. Some authorities assert it is little short of criminal to make any internal examination,and we all concede that the fewer the chances for the introduction of foreign germs, the safer it is for the patient. The physician often wishes to ascertain the condition of the cervix, and when the water breaks, it may be advisable to confirm the diagnosis of the presentation. Two examinations before the head appears at the vaginal orifice will generally suffice, and even these may be dispensed with, if the diagnosis was made before the onset of labor, and if there is evidence of satisfactory progress. The cries of the patient have some diagnostic value; during dilatation of the cervix, they are piercing, but during the expulsive stage they are low pitched and grunting in character. If the physician has been attending any doubtful case of surgery, or any infectious disease, no vaginal examination should be made. Here comes in the value of the visit prior to labor; for the presentation was diagnosed before the tissues were yielding and ready to absorb poisonous germs.

If necessary to puncture the bag of waters, the needle should be disinfected by heat and then kept in a carbolic solution till used. During descent of the head it may be for some reasons advantageous to insert the fingers in the rectum, but a decided objection to this proceedure is that it may be necessary to put the hand in the uterine cavity after the termination of labor, and the danger of infection would be greatly increased.

In order to avoid laceration of the perineum the head should be allowed to impinge on that structure for some time. When the tissues have been rendered soft and dilated, and the parietal bosses have escaped the pubic arch, the head may be shelled out of the vagina between the pains. The tendency of the patient to make violent expulsive efforts must be controlled,

and if she cannot be made to keep her mouth open, chloroform should be given. During the regulation of the birth of the head, the vessel containing the bichloride should be conveniently near, so that the hand can be dipped in it between the pains. When the child is expelled, a piece of absorbent cotton wrung out of 1-2000 bichloride should be applied to the external parts, and the uterus grasped firmly. It will generally be possible to expel the placenta by Crede's method.

The washing of the patient should be done with borated cotton and not with old cloths. Any warm antiseptic solution may be used. The nurse should give her whole attention to the mother. If the baby is oiled and put in a warm place, that is all the attention it needs for several hours. The nurse or the husband should hold the uterus for one hour after labor, for this is the best prophylaxis against hemorrhage. If stitches have been taken in the perineum, the wound should be dressed like any other surgical wound. Dr. Kelly, of Johns Hopkins recommends that a finely divided mixture of iodoform one part, and boracic acid seven parts, be thrown into the vagina and vulva, whether there is rupture or not. Any antiseptic powder is a grateful protection to the lacerated tissues. If iodoform is disagreeable and there is no rupture, after the first few days borated talcum may be dusted on the parts after each washing. For the first twenty-four hours it is necessary to keep a close watch of the uterus in reference to hemorrhage. During that time the ordinary binder, if employed, is in the way, but later if the patient so desires, the binder may be used as a matter of comfort.

Whether or not vaginal douches shall be given depends entirely on the ability of the nurse. The douches certainly are cleansing, they aid involution, they are grateful to the patient and a good sedative. If the nurse has a knowledge of asepsis, and will follow minute directions in regard to disinfecting the syringe with boiling water, and will see that the nozzle is surgically clean; if she will cleanse thoroughly the external parts of the patient and her own hands, then the douche may be ordered with a clear conscience. The patient should be warned about keeping her own nails and hands perfectly clean. Cases of

septic fever in the Rotunda Hospital were traced to the fact that patients washed themselves with unclean hands.

It is undesirable that the nurse should use the catheter after labor, but in case this should be necessary, minute instructions must be given in reference to washing the external parts, especially about the meatus, disinfecting the catheter, oiling it with carbolized glycerine and inserting quickly.

When the milk begins to come the jacket breast bandage is a great comfort to the patient. Its use prevents that heavy sagging which is so disagreeable, and the lifting of the breast prevents stasis and engorgement. The jacket is called a Garrigues bandage, but is used in many hospitals in New York. In the Sloane Maternity it is used in every case and in their first thousand patients there was not a single instance of mastitis. The bandage is made of a yard of unbleached muslin. This is doubled, and places cut out of the upper edge to fit the neck, and deep arm holes are made. The bandage is pinned from below upward, while the breasts are raised. The shoulders are pinned last. There should be enough width here to give efficient support from above.

Astringent preparations are often recommended to harden the nipples. Dr. Davis, of the New York Infant Asylum, who has had a large experience, thinks oil the natural remedy to render the epithelium cohesive. Oil, when applied to rough and chapped hands, has such a beneficial effect that this treatment seems rational and sensible. It is desirable to begin the use of the oily preparation directly after labor, and it would be better to use it four times a day during the last two weeks of pregnancy.

The chief dangers to be feared in an ordinary labor case are hemorrhage, sepsis and later, mastitis. Most of the precautions mentioned are in reference to these possible occurrences. For many reasons it seems wise to prevent visitors from entering the sick room, for at least one week. The excitement is not beneficial to the patient, and the callers may carry the dust of contagion in their garments.

It is hoped the details referred to in this paper will not seem pedantic, unreasonable or impracticable. Asepsis, which

can never do harm, has been much more strongly dwelt upon than antisepsis, which has possible dangers. Excess of zeal is never advisable. I agree with Dr. Carroll when he says: "Antiseptic measures need hardly extend to a bichloride baptism of the child's advancing head, or its birth into a carbolized fog." And yet when one is disinclined to personal effort, it is easy to sneer at what may be called undue zeal in others.

It is a well known fact that many patients do very well in labor where no precautions of any kind are taken. Circumstances can not be so bad that some patients will not thrive. In the out-patient department of hospital practice, I have known cases where the family were too poor to have a light, the labor had to be conducted in the dark, and necessary utensils were so lacking, the baby had to be washed in the dish-pan and three days after labor the mother was down on her knees scrubbing. The patient did well enough, at least she did not die, but that is no argument in favor of such a method of management. It only proves some people are hard to kill.

The high-minded and conscientious physician should not be satisfied because his patient gets along well enough. He should only be satisfied when he has given to each case the advantage of the best science available. It may be conceded that many of the details mentioned in this paper are wise and even necessary, but it may not be possible to adopt them in every case, especially when there is need for urgent haste. The conscience of the physician will be clear if he takes as many precautions as are practicable under the circumstances. If he makes a visit prior to labor and his suggestions are ignored, it is not his fault.

The teaching of sanitary science is the most discouraging thing in the world, yet it is the duty of the physician to faithfully instil its principles. Often there is no immediate result. It is here a little and there a little, precept upon precept. Growth is always slow. It takes women a long time to change their preconceived ideas. If a patient has had one or two labors in which she received no scientific attention, and yet made a good recovery, it is almost impossible to make her think any extra precautions are desirable. This is the fault of her previ-

ous physician who established a bad precedent. In talking with a patient about her former labors one sees at once whether or not she has been well instructed in sanitary matters. It is worthy the ambition of a conscientious physician to sow carefully, even though others shall reap the benefit.

There are many women who will not thank a physician for causing them any extra trouble and expense. In working for them against their own wills, he must remember "if they were gratefuller they were not so pitiable." But there is an intelligent class of women whom it is a delight to aid and instruct. There is something pathetic about the way they will follow the least directions of the physician. To be busied in preparations that will help to make the labor safe, tends to relieve the anxious forebodings of the last two weeks. A woman who would be willing to die of typhoid fever, can not endure the thought of her labor terminating fatally. There is the baby to be thought of. She knows that no amount of love and patience can ever teach a man what a young child needs. She is eager to live through the ordeal, and ready to adopt any measures conducive to that end.

The ideal of the physician should be to give to each obstetric patient the best chance possible for life, comfort and safety. He must see to it that no one can rightfully accuse him of any "voluntary blindness, any interested oversight or culpable negligence."

DISCUSSION.

Dr. Grissom. I desire to say one word only: I have been practicing obstetrics for 35 years, and I must confess that this paper suggests to me facts that have never before occurred to me, or never before suggested themselves, and I undertake to say that this paper places this Society, and every person here, under a debt of gratitude to the distinguished doctor.

I have no hesitancy in saying for the author, that during an experience of 35 years in which I have attended medical meetings from inter-national, down to local, I have never heard a paper containing more common sense in fewer words.

Dr. Munn. I feel personally, grateful to Dr. Lobin-

gier for the many sound suggestions made in this paper, and if there are two or three points that I may speak of, it is simply to emphasize them, and draw the attention of the Society to the present importance of them in this community; and the first is in regard to the practice of midwifery.

In the city of New York, we have been told, any cook who gets tired of her position can go to the health officer, pay 50 cents and become a midwife. Here, all she will have to do is to go to the health officer and write her name in the book. Last November eleven deaths occured from puerperal fever; eleven deaths in a population of 120,000. On inquiry I found at least one-half of these women had been attended in their .confinement by one midwife; they did not however, all die under her care; when they got very bad a physician was usually called in. I enquired for, and found this woman; she was as filthy as possible, and had a carbuncle or some such thing on her foot. I called her down to my office and had a talk with her, and it was worth ones life to remain in the same room with her, the odor was so offensive.

Later when this woman was brought before the courts, the law was so interpreted as not to hold her. The Judge said the practice of midwifery was not a branch of medicine or surgery. It seems to me that the special committee appointed a year from to-day to labor with the next legislature, might have some effect in inducing the legislature to define just exactly what the practice of medicine and surgery is. If we can, through the action of this Society, save a few of these lives that are being sacrificed so recklessly, I might say that much good will come from Dr. Lobingier's paper to-day.

In reference to antiseptic pads, I desire to say that I have been in the habit of using antiseptic pads for six years. By the use of these pads any rise in the temperature may be avoided and the lochia will remain free from odor; this can be attained without the use of internal irrigation. The use of the pads is not as general as it might be, and I am very glad the doctor has called attention to the fact and brought these samples here.

In reference to having carbolic acid in the house I

believe it is a good thing to have, if the bottle is kept away from other medicines. We had recently, in this city, two cases of poisoning, in one of which the nurse made a mistake, and gave a dose of carbolic acid: it is a dangerous practice to put it with the medicine bottles.

DR. HALL. In connection with what Dr. Munn has said, I would like to add something to the discussion of this very excellent paper. I had intended to speak of the matter of midwives in the same way as Dr. Munn. Owing to my connection with the State Board of Examiners, I spent several days in a justice of the peace court, offering evidence which I hoped might aid in convicting the midwife of whom Dr. Munn spoke, of practicing medicine illegally. In both the trials the woman was cleared on the ground that she was not practicing medicine. There seemed to me to be enough evidence to convict anyone, but she was cleared.

When Dr. Munn spoke of the odor, two or three people smiled. If they had been in my office,they would have been disgusted instead of smiling, as the odor from this ulcer was outrageous.

There is another fact: One may be exposed to almost any amount of direct contamination without any serious result following. Some two or three years ago, I remember seeing in some journal, a statement to the effect that the dirt found around a country farm house was much less liable to do harm than that in the city. I will very briefly speak of two cases that will serve to illustrate this: One of these was a Polish woman who had been in labor between forty-eight and sixty hours, although she had previously had nine children without any trouble. After a drive of sixteen miles, I reached the house, which was simply a sod house without ventilation. The room in which the woman was confined was so close, that I had to leave it once or twice, for fear I would vomit (the discharge was so putrid.) After establishing my equilibrium, I delivered that woman without forceps, (she would not take ether) and went home, fully expecting she would send for me again, having the usual symptoms of puerperal fever. In about forty-eight hours I saw a messenger coming; however it was

not to notify me of a case of fever, but that the woman wanted to know my name, that she might name the baby after me.

Those of us who have done any railroad work are conversant with the kind of cars used in construction trains for housing the gangs. When a freight car gets too bad for traffic, it is generally put on a construction train and used for this purpose. I remember a woman being confined in one of these dens of abomination. She was an Irish woman and had been in labor one or two days, and was being attended by a midwife. The conditions were much the same as those I mentioned in the previous case; everything was absolutely vile, and the case had to be delivered by forceps, yet everything went on beautifully, and in two or three days the woman was up and cooking for the outfit.

It seems to me almost impossible that American women could stand such an ordeal, and the only explanation I can give is that mentioned before.

Dr. Davison. My early practice was in the southern part of the State where the population is largely Mexican, and where I attended a great many of the women in confinement. I saw women who had been attended by midwives who had failed to remove the placenta, and I can not recall a case of fever in a great many such cases. After the confinement, it is with the greatest difficulty that you can get them to wash the patient. I have known them to be soiled with decomposing blood twenty-four hours afterward. They are a class of people who wash very little, and I never knew of but one case in which the clothes of the child were made before hand. I have attended cases where the bread pan was used as a bath tub. I have also seen cases where there were fourteen people in the room where the woman was confined, yet she would come out all right. Usually the advent of the child was announced by the firing off of firearms; after this was done the visiting friends would all go around and congratulate the mother. I knew one case where the mother was up in two hours after confinement. Can it be that in these cases Providence takes care of these people?

In a majority of cases, they are not attended by physicians. In *post partum* hemorrhage twice I have been called, and

found the patient held bolt upright in the arms of some midwife or the husband, and stone dead. I think that accident must happen fifteen or twenty times a year in Las Animas county.

I feel grateful, as all of us must, to Dr. Lobingier for her paper. It covers the ground very carefully, and is from the stand point of a woman. The doctor occasionally speaks in a tone of sarcasm, but she doubtless has her reasons for this.

DR. TAYLOR. If there is such a law as this on our statute books, I think the Board of Health is amply justified in proceeding. I know of four cases in the last six months that have come to their death at the hands of these same women.

In regard to Dr. Lobingier's interesting paper, there are a number of points of interest that I could speak of, if we had more time; I will only refer to one. She spoke of the desirability of having the hand of the attendant upon the uterus for an hour after labor, and having it closely watched for twenty-four hours by the attendant or husband, as a preventive against hemorrhage. I have had so little trouble from hemorrhage that I am less careful. I do not think there is such a risk of hemorrhage that this should be done. If the uterus at the end of the first hour is contracted, and there is no show of hemorrhage, I at once put on a bandage. I do not think the uterus needs to be investigated so closely as this; indeed I doubt if the ordinary nurse, certainly I doubt if the ordinary husband, is able to tell much about the uterus. I have seen a medical student who could not detect the condition of the uterus. Under these circumstances, the uterus is soft, and it requires a good deal of skill to find it. The binder, if properly applied, I consider rather a safeguard against hemorrhage.

DR. WILSON. I would like to make a statement relative to the midwife spoken of here. I was on the board of health five or six years ago, when that same midwife came before the board and asked permission to practice. We asked her for her credentials, and she produced a little piece of paper, about six lines, and said that was her diploma. I heard she had been saying that she had a diploma, but this was only a certificate

from some Polish doctor stating that she knew something about midwifery.

Now, in the late trial before the courts, our newspapers took it upon themselves (one at least, and others I think) to state that she had diplomas from German schools of medicine. There was not a word of truth in it. It produced a wrong impression and tended to fasten that woman in the confidence of the community, and that in the face of the fact that we have heretofore had these midwives up for producing abortion and other crimes. I have been in Denver twenty years, and we have been fighting these cases all that time. However, they will always have a lawyer who will impress on the jury that the doctors want them done away with, so that they can have the business themselves. In regard to such lawyers, I have thought of what Tom Moore wrote to Miss Godfrey in one of his letters. It was an epitaph as follows:

Here lies John Shaw,
Attorney at Law;
And when he died
The Devil cried:
"Give us your paw,
John Shaw,
Attorney at Law."

It strikes me it would be a pretty good epitaph for such men as defend these women in criminal courts.

In regard to the ladies who have read papers here to-day, as the president of the Society, and in my own behalf, I have to say that I rejoice that they have come to our assistance in this business of fighting disease. The men in this and other countries have been fighting disease for centuries, and we find that it has been a hard and perplexing duty; and I for one (and I believe I speak the sentiments of the physicians present this afternoon) rejoice that these women have come to our rescue in this matter. I am sure that with such women as we have had to read papers before us to-day, it will be an easier matter to wage a war of extermination against disease, having the aid of intelligent, thoroughly educated female physicians.

Dr. Lobingier. In reference to the abdominal bandage, I do not believe it is necessary, and it may do harm by pressing

the uterus backward; but if the patient feels that she must have it, I allow it to be applied, simply as a matter of comfort.

In reference to hemorrhage, I never had a case of *post-partum* hemorrhage, and never want to. If the uterus is held for an hour after labor and thus firm retraction secured, there will seldom be any danger of excessive flooding. The husband or some other unoccupied person can easily be instructed how to apply the necessary pressure.

As to sending for a doctor in cases of *post partum* hemorrhage, there is no time. There must be some one there who can act at once. The uterus when contracted, is a hard and prominent tumor and a person of ordinary common sense can recognize it after it has once been demonstrated by the physician. The nurse or husband should be able to recognize whether or not, the uterus is contracted as this is a guide for action in case of hemorrhage.

I wish to thank the members of the Society for the kind manner in which they have received my paper. When I chose this subject, I was well aware that it was a hackneyed one, but it seemed to me the discussion of such an important topic would be an advantage to all women. An interchange of views on minute details of ordinary practice is often of value, because the books and journals generally devote most of their space to rare and interesting cases.

SPONTANEOUS ABORTION.

By Chas. F. Shollenberger, M.D., Denver.

In selecting this subject to-day, I shall include in its scope all cases which are spontaneous in their origin, or in other words, all such, which as far as our knowledge extends, have not been produced by any criminal intent. Many members of the profession use the term abortion as referring to all cases of premature expulsion of the contents of the womb, but strictly

defined, it should be used only in cases where the ovum has been expelled prior to the fourth month of gestation. That abortion is an occurrence of great frequency we all know, and we have all seen cases in which the ultimate consequences have been very serious and might possibly have proved fatal. In the aggregate, the number of fœtal lives thus lost must be enormous, for it is variously estimated by eminent authorities, that at least one abortion occurs to every five or eight deliveries at full term. There are certainly very few married women who have not aborted once or perhaps several times at some time or other during the child-bearing period. Outside of the great sacrifice of fœtal life, the influence that abortion may have on the future health of the mother must be taken into consideration, for in addition to the great debility it may produce through long continued and excessive hemorrhage, it certainly is one of the most fruitful sources of uterine diseases in after life. This uterine disturbance is often produced, not so much through the abortion *per se*, as through the carelessness of the patient in not fully realizing the serious consequences that may follow. The accident is far more frequent in multipara than primipara, although authorities differ on this point. I should judge that I have had at least a half dozen cases of spontaneous abortion in multipara to one case in primipara. Especially do we find a great liability to a recurrence of the accident in multipara who have aborted more than once, some aborting with such frequency and regularity that we may almost say a habit of aborting has been formed. Those cases of spontaneous abortion which occur very early in pregnancy, say at from two to six weeks after conception has taken place, frequently pass undetected, the patient not being aware that such an accident has taken place. Quite a number of cases have occurred in my practice in which I was consulted for too profuse menstruation, the patient stating that she had gone over her time a week or two. It is quite likely that in many such cases spontaneous abortion had taken place, the ovum being so small that its escape had not been detected by the patient The frequency of abortion varies very much at different periods of pregnancy, being far more frequent at two and three months than at any

other time. This is due, in great part, to the extreme vascularity of the uterine mucous membrane and to the very slight connection which there exists, between the chorion and the decidua.

The statistics of the Maternity of Paris show that far more women abort at four or five months than at an earlier period, but as against this it might be said that few women go to the hospital for an abortion at two and three months and that, as stated before, many cases of spontaneous abortion occur entirely unaware to the patient, who usually ascribes the profuse flow to her having missed her time several weeks. But whatever the period at which the accident occurs most frequently, all must agree that it subjects the patient to many risks both as to health and life, and on this account deserves special study and consideration at the hands of the obstetrician and gynecologist.

The *causes* of abortion are many and varied, but for the sake of convenience and brevity, may be divided into predisposing and exciting. In many cases the exciting cause is really so slight that were it not for the habit of aborting into which some women fall, the accident would seldom occur.

The predisposition which some women have to abort may be due to impaired health or vicious habits in the mother, to a chronic diseased condition of the womb and its appendages, or to some condition directly interfering with the vitality of the ovum. Even the father's health, may occasionally have something to do with the production of spontaneous abortion, as witness a case given by Cazeaux, in which a woman aborted a number of successive times with her first husband who was old and syphilitic. On the death of her husband, she married again, and has since given birth to a number of children at full term, her second husband being young and without any syphilitic taint. In such cases Cazeaux recommends that the father rather than the mother be placed under prophylactic treatment. Within the last six months I have seen at least two cases, in which I think the histories pointed to the father as being the cause of the abortions in the wife.

The death of the foetus is a very common cause of

spontaneous abortion, for by producing secondary changes, it brings on uterine contractions which finally end in its expulsion. Under such circumstances, it is, in many cases, utterly impossible to trace the direct cause of death as it may have been due to disease either in the maternal or ovular structure, or probably both have combined to produce the result. The death of the ovum, naturally leads to changes in the relations which exist between the maternal and foetal structures, hemorrhage takes place either into, or external to the membranes, and the effused blood, thus acting as an irritant, produces uterine contraction. If there should be extravazation of blood, in that part of the decidua near the internal os, separation of the membrane frequently does not take place and pregnancy may continue. This explains in part. many of these cases in which we have seen a periodical discharge of blood continue for several months, or even all through pregnancy, or an irregular discharge at various times, and yet the pregnancy continue to full term.

I believe, however that in the majority of cases the cause of spontaneous abortion is due to some condition in the mother, that condition, whatever it may be, causes a congestion or hyperæmia of the uterus, which in turn produces the accident. Women who lead unhealthy lives, who follow blindly the exacting dictates of society life, and who are addicted to alcoholic excesses, are very liable to abortion. Our common prostitutes are also very prone to the accident, due no doubt, to the extreme indulgence in sexual intercourse, although it may also be stated that no doubt this extreme indulgence in sexual congress is one of the main causes preventing such women from becoming pregnant.

Many of the acute diseases, such as scarlet fever, small pox and measles, are very common causes of abortion, and when, as is occasionally the case, the accident is produced by bronchitis, or pneumonia, the complication is one which is very serious and often fatal in its results.

As far as chronic diseases are concerned, probably nothing has such a strong maternal influence as syphilis. I have, as a patient now, a woman who formerly was a member of the demi-

monde, but is now married and seems to be living a virtuous life. Within the last two years, I have attended her in no less than three cases of abortion, all between two and three months of gestation, none of which, as far as I could ascertain were brought on by any criminal means. It is only within the last eight months that I discovered what her past life had been, and drew from her a history of syphilis. I at once placed her on anti-syphilitic treatment and she is now again five months pregnant and bids fair to carry the child to full term. Of course this is only an isolated case, but as such bears rather strong presumptive evidence of the injurious effects of syphilis on the growing ovum.

Among other maternal causes we might briefly mention the accidental swallowing of poisons, chronic lead poisoning, carbonic acid gas poisoning, as in a case mentioned by Parvin, the patient being overcome by coal gas, etc.

Impressions made upon the nervous system have a wonderful effect in producing abortion, and no doubt all the members of the Society have seen cases in which fright, great anxiety or a sudden shock have acted as the exciting cause. I remember one case in my experience, in which the patient a primipara, three months pregnant, was suddenly aroused at night by an alarm of fire in the next house. The shock was so great as to throw her into an attack of hysteria which I had considerable difficulty in controlling. She commenced flowing rather freely next day, and aborted the second day after receiving the shock, happily without any serious results following.

Affections of the ovum, or parts of it, can be classed as frequent causes of abortion, among which may be mentioned inflammation of placenta; calcareous degenerations or deposits in the placenta, a diseased condition of the membranes causing their rupture and dropsy of the amnion.

Outside of the causes already given, we may have certain physical causes producing the accident, such as a fall or a blow, slipping down stairs, or on the ice or other accidents often of a seemingly trivial nature. On the other hand, when we remember what excessive violence is occasionaly used to produce abortion, and that unsuccessfully, may it not be that the physical

causes just mentioned singly operate in women who are predisposed to the accident. Parvin mentions a case of a woman, 5 months pregnant, who fell from a third story window, injuring herself severely, and yet carried the child to full term.

Morbid states of the uterus itself, such as fibroids, peritoneal adhesions, flexions and displacements are more or less frequent causes of abortion, but we have already mentioned causes sufficient to show the varied and different influences which act in producing this frequent and very troublesome accident. *Symptoms:*—The symptoms which precede abortion and which may be considered as premonitory are few in number and can never be regarded as very reliable. They are as a rule far from uniform, and each case presents its own individual peculiarities and characteristics. In the more advanced cases, where quickening has been felt, motion ceases entirely, indicating that the fœtus is dead, although this is far from being a reliable symptom. Some complain of a feeling of coldness, others of a general nervousness or feeling of fear, but we can well see how all these symptoms may be produced by other causes. In many cases there are no symptoms whatever that may be regarded as premonitory, and indications denoting the commencement of the process of abortion are the first observed. These are generally pain, hemorrhage and evacuation of the liquor amnii, although these symptoms do not necessarily appear in the order named. I have seen cases in which, after a slightly dull, heavy feeling during the day, there was a sudden gush of blood, followed soon after by the expulsion of the ovum, there being little, if any, pain. In many cases however, the hemorrhage is preceded by intense pain, until the os being thoroughly dilated, the ovum is expelled and pain ceases. In many cases the hemorrhage is very profuse, and its long continuance and excessive amount forms one of the gravest symptoms of the accident.

As stated before, in the earlier weeks of pregnancy, the ovum may pass undetected, so it is always important to examine the discharges, or should we be called to see the case before hemorrhage has commenced, it is very important, in order to establish a clear diagnosis, that the patient be requested to save all discharges for our examination.

Diagnosis: The positive diagnosis of abortion is at times an exceedingly difficult one, for, previous to the fourth month, at least such has been my experience, it is often impossible to give a positive opinion that pregnancy really exists. How often we find that in the earlier months of pregnancy, the so-called subjective symptoms indicating that condition, may utterly fail.

Should we be called to a patient, in whom the menses have been suppressed for several months, and find her with slight pain and some hemorrhage, the question will naturally arise, is the woman pregnant, or is it simply the return of normal menstruation.

There are a number of cases in which the pains incident to a return of a suppressed normal menstruation, are very much like those accompanying abortion. This difference, however, is generally noticeable, that in suppressed menstruation not due to conception, almost as soon as the flow was fairly well established the pains lessoned or ceased altogether, while the pains of abortion continued, often increasing in intensity, until the ovum was expelled. Even these signs are not sure, for the contrary often occurs. Although the diagnosis is often far from simple, yet it is very important to know whether pregnancy really exists. Notwithstanding the fact that there may be many uncertain signs present, yet there will usually be some signs by which we can be assisted in forming a probable diagnosis. Sould we be called to see a patient who has been regular in her menses, whose flow has been stopped in a sudden and unaccountable manner, and especially, if this suppression has been followed by some of the usual symptoms of pregnancy; if the pains which are present are more severe and of longer duration than under ordinary menstruation, and continue, notwithstanding the discharge, we may reasonably assume that abortion is impending. The diagnosis becomes still more positive, if the hemorrhage seems excessive, if clots are expelled, and if the os is dilated sufficiently to pass the tip of the finger. There are other points in the diagnosis, which I have not mentioned, but which I trust will be brought out in the discussion.

Prognosis: As to prognosis, our opinion must necessarily

be always more or less guarded. Should the patient have slight pains, and those unaccompanied by hemorrhage, we can very often assure her that the chances are in favor of our arresting the impendiug abortion, but should we have considerable flow, with the os dilated, the chances are strongly against successful interference. The result, to the foetus, is naturally always fatal, since it is expelled from the womb before the age of viability, while we can never be positive what the ultimate result may be to the mother.

Treatment: In the line of treatment there are several indications, the first of which is the prophylactic or preventive. Should the woman have been in the habit of aborting, and we know either parent to be syphilitic, matters should be explained to them, and if possible, a mercurial treatment instituted. When the so-called habit of aborting has been formed, every precaution should be taken against undue exercise, or violence, and, if necessary, complete rest in the recumbent position should be advised, especially during the week of the usual menstrual period. In all cases where abortion is feared, fatiguing exercise, sexual intercourse, aud in fact anything that has a tendency to cause an increased flow of blood to the womb, should be strictly prohibited. Even a mild cathartic, has been supposed to be the exciting cause of a case of spontaneous abortion.

Should, however, all the symptoms of abortion be present, two indications present themselves; the first is, if possible, to arrest the impending abortion; secondly, if this be impossible, to cause expulsion of the foetus, and its appendages as speedily as possible, so as to relieve the woman from all source of danger. If the hemorrhage and pain have been very slight, and the os is not dilated, there is reasonable hope that success may attend our efforts.

The patient should be compelled to remain in the recumbent position, not even rising to evacuate the bladder or bowels. The diet should be light and easily assimilated, and all her surroundings be as quiet as possible. As a means of preventing uterine contractions, I usually give morphia sulph. grain $\frac{1}{8}$ in powder form, repeated every two or three hours, until all signs of contraction have ceased. In the use of opium, care

must be taken to prevent nausea and vomiting, as well as its constipating effects, either of which may prove an exciting cause in producing and promoting uterine contractions.

I have also used chlorodyne in a number of cases, in 20 gtt. dose, with good success, as it is far better borne by the stomach than any of the preparations of opium. It may at times be necessary to give the medicine by rectum should the stomach be very irritable.

Should these means fail, or the case have already advanced so far as to preclude the possibility of arresting it, our next duty is to favor expulsion of the ovum as soon as possible. Should the os be sufficiently dilated, and the pains strong, a vaginal examination will often detect the ovum protruding from the os, and occasionally it can be removed with the finger. I must confess that my experience does not agree with those authorities, who say that it is a very easy matter to detach and remove the ovum by simply depressing the fundus, by external pressure. In the majority of cases, unless the patient is anesthetized, and the entire hand passed into the vagina, the tip of the examining finger will reach only to the internal os, and unless the ovum is already detached and lying in the os, it will be impossible to reach it. With the hand in the vagina, I have generally been more successful, in detaching and removing the ovum than with the placental forceps.

In cases however, where the os is not sufficiently dilated to adopt a procedure, such as just mentioned, measures must be taken to control the hemorrhage which often proves such a serious factor in the case.

In such cases, plugging or tamponing the vagina certainly proves a very valuable expedient. Various methods are used in doing this, the method I usually follow being to use a number of balls of absorbent cotton, soaking each one in glycerine, or sweet oil, to prevent the offensive odor which otherwise often arises. I also fasten a string to each one of them to facilitate their removal from the vagina without causing unnecessary pain. Compressed sponges may also be used, but unless they have been treated antiseptically, they occasionally act as rather a harsh irritant. During the time the vaginal tampon remains

in place, which is usually from 6 to 10 hours, from two to three full doses of fl. ext. ergot can be given, and often on the removal of the tampon the ovum will be found lying loosely in the os uteri, as the tampon and ergot combined act as a strong excitant of uterine action. In many cases we find the ovum entirely out of reach; and the os undilated, and here sponge or sea-tangle tents are of great use. After introducing the tent, it can be kept in place by means of a vaginal tampon, the two combined generally controling the hemorrhage sufficiently to prevent any danger from that source. The tent will generally succeed in dilating the os in from four to five hours. Barnes' dilators and various air tubes have also been successfully used in producing dilatation.

The cases, however, which have given me the most trouble and at times caused me considerable anxiety, are those in which the foetus is first expelled, and the placenta and membranes remain intact. In such cases we can well see that as long as they remain the patient is continually in danger of septic poisoning.

I might add that should opium not be well borne by the stomach it can be given in the form of rectal suppositories. One of the surest methods of stopping contractions of the womb is by hypodermatic injections of morphia, about one-sixth of a grain, but even here, the danger of producing excessive vomiting must be taken into consideration.

In giving opium by the stomach, it is often of considerable advantage to combine with it some doses of bromide of potash or sodium and chloral. I frequently use viburnum prunifolium (Haydens) with a fair degree of success in preventing the threatened abortion. In those cases in which we have excessive hemorrhage,there is no question in the minds of all practitioners that the hemorrage must be stopped. However, after we have succeeded in stopping the flow, which can usually be done by iodoform gauze, or cotton tampons, the question will often arise, after we remove the tampon, should we interfere surgically if the ovum is not expelled by the contractions of the womb.

Here there certainly is a great difference of opinion as to

the proper course to pursue. Should we treat the case on the expectant plan, or at once remove the contents of the womb?

Although I believe the safest plan is to remove the dangerous mass as soon as possible, yet 33 per cent. of my cases, thus far, have been treated on the expectant plan, and I have not yet seen any fatal results, or even serious results, follow such treatment. Of course, in speaking of the the expectant,or conservative plan, I mean that at least from 48 to 72 hours should be allowed nature, after the flow has commenced, to expel the contents of the womb. During this time antiseptic injection should be used, at least every six hours. In following the expectant, or conservative plan, the question will naturally sift itself down to this: Is this procedure more dangerous than would be the immediate removal of the secundines? I believe it is fraught with greater danger, but, where the patients refuse operative interference or where there are other causes contra-indicating such interference, I believe if proper antiseptic precautions are taken the danger will be greatly decreased.

Munde says: "The future safety of the patient demands that the secundines should at once be removed, after the expulsion of the fœtus in every case in which such removal can be accomplished without force sufficient to injure the woman."

Parvin, on the other hand, recommends non-interference with the cavity of the uterus in abortion, unless, at some later period, hemorrhage occurs or septicæmia is threatened.

If it should be found necessary to use the curette, great care must be taken not to injure the walls of the womb.

But recently a case was reported from Berlin in which the physician causedthe death of his patient in perforating the womb with a curette, following an abortion.

In all radical operations to remove the secundines strict antiseptic precautions should be taken, the womb being washed out with a 1—4,000 corros. sublimate douche, or the cavity may be mopped out with Churchill's tinc. iodine, or 50 per cent. solution of carbolic acid.

Although there are many physicians who strongly insist upon the expectant plan, that is, to wait until nature effects expulsion, or the indications are such as to point to the necessity

of interference, I firmly believe that the sooner the dangerous mass is removed the better for the patient in the vast majority of cases. Cases are however met with, in which rapid emptying of the contents of the womb is not advisable, and, in such cases, assisted by dilating tents and vaginal tampons, nature will generally effect detachment and expulsion of the secundines in a day or two. Of late, I have used antiseptic injections of two or three quarts of warm water, and I believe they assisted very materially in loosening the secundines and assisting in their expulsion. In many women, especially those who have not had medical attendance from the beginning, we find the os completely closed and yet there is a continuance of the hemorrhage often associated with a very offensive discharge. In such cases, the os must be dilated by the usual means, and the uterus thoroughly explored, if necessary, using an anesthetic so that success may attend our efforts in removing the cause of the disturbance. It may be necessary to use the curette in order to thoroughly remedy the evil. Thoroughly appreciating the evils that so often follow abortion, we should caution the patient to remain in bed at least as long as at full term, so that involution of the womb for which nature was unprepared, may take place as rapidly and completely as possible.

Women do not understand the dangers that may follow abortion, and we should consider it part of our duty, to educate them on the subject, for, in the better education of our patients concerning the proper care of their bodies, will lie much of the duty of the conscientious physician in the future career of medicine.

PRESENTATION OF A CASE OF A MANGLED ARM.

By O. J. Pfeiffer, M.D., Denver.

I wish to illustrate here, a most interesting case, that of a mangled arm. The subject, a powerfully built man, Superintendent of the Denver,Lakewood & Golden R.R.,fell and slipped under the wheels of the coach. If you think of standing on a banana peel and slipping, you get an idea of how this arm was injured. The elbow was crushed by the wheel, the head of the radius flying across the track where it was found the next day. I remarked at the time I first saw it, that it was a good case for excision. The doctor who brought the case down from Golden, said to me afterward that he thought I was a fool, but remarked later, that in his day, it would be considered a case for amputation. Afterwards, for three days I thought I might have been a fool.

The case was taken to the city hall, and the next day I took him to St. Lukes. Talk about antiseptics; there was no chance for antiseptics, the arm was so mangled.

We put the man on the table, etherized him, and performed excision of the elbow, the head of the radius was already off. We cut off the ulna just above the articular surface of the humerus. I put in drainage tubes along the forearm, and covered the wounds with hot flaxseed poultices,changing them and syringing the tubes every hour, and had a special nurse in attendance. For nearly a week that arm was treated in that way. For four days his life hung in the balance, and for six days St. Luke's hospital was filled with the odor from the wound. The free drainage and cleaning out of the wound saved the man's life. You see he has now the power to bring his arm from a straight line to a right angle and will be able to raise the arm still more as he gains strength in the biceps. His hand is very useful and the entire result most excellent.

Note.

By resolution adopted during the session of 1872, the Colorado State Medical Society does not hold itself responsible for the doctrines or statements contained in any paper published in the "Transactions."

A. Stewart Lobingier,
E. R. Axtell,
H. W. McLauthlin,
Thos. A. Hawkins,
T. E. Taylor,
Publication Committee.

Minutes of the Twenty-Third Annual Session

OF THE

Colorado State Medical Society,

Held in Denver, Colo., June 20th, 21st and 22nd, 1893.

TUESDAY, JUNE 20th.

MORNING SESSION.

Society was called to order at 10 A. M. by President, William E. Wilson.

Prayer was offered by Rev. Dr. Rankin. The minutes of the previous meeting were read and approved.

The Executive Committee submitted the program as its report, and asked permission to report to the society in installments during the session. The request was granted.

The Publication Committee reported as follows:

"The proceedings of the society for 1892 consisting of 350 copies of 394 pages each, and containing thirty-eight papers and their discussions, together with the usual minutes, constitution, by-laws, etc., were issued in September, 1892. A supplementary list of deceased members was incorporated in this issue of the proceedings, on the suggestion, and by the kind and efficient assistance of the late and honored member, Dr. H. K Steele.

"The publication of the Proceedings occupied over nine weeks of consecutive work on the part of the Committee, and the issue comprises almost a half more in printed matter than any report of former years.

"*The Committee desires to impress upon the members the extreme importance of correct English, punctuation and form of copy, before submitting the manuscript for publication. The work of the Committee would be more than half anticipated, were more thoughtfulness exercised by the members in these matters.*

"The plan of sending all proof of articles and discussions to the authors, was last year first inaugurated; and while no doubt more satisfactory to the members it proved a cause of much delay in the issue of the Proceedings.

"The style of binding of the Report was not satisfactory to the Committee, and they beg to recommend to the Society the propriety of binding future Proceedings in cloth."

The report was received and ordered filed.

Dr. John Chase presented the first paper of the session. It was entitled, "Statistics Concerning Eye Diseases in the Rocky Mountain Region." It was discussed by Drs. Black, Rivers and LeMond.

Dr. John M. Foster read a paper entitled, "Heterophoria." It was discussed by Drs. Chase, LeMond, Black, Green, P. D. Rothwell and Pershing.

"Operations on the Eye for Cosmetic Effect," was the title of a paper read by Dr. G. M. Black. It was discussed by Drs. Girvin and Bane.

The Committee on Admissions reported favorably on the following named physicians, and on motion the Secretary was instructed to cast a ballot for the admission of each.

Dr. E. P. Hershey,.....Denver.
" John G. Keith,.....Leadville.
" Frank D. Green,..... ....Pueblo.
" P. F. Gildea,.....Colorado Springs.

Dr. Mary T. Lowrey,.....Boulder.
" Chas. Manley,.....Denver.
" F. E. Yoakum,.....Denver.

Dr. William C. Bane finished the morning session by reading his paper entitled, "Ulcers of the Cornea." He exhibited a number of drawings. Dr. John Chase discussed the paper.

All the papers of the morning were referred to the Publication Committee.

AFTERNOON SESSION.

The Society convened at 2:15 p. m.
The Treasurer reported as follows:
June 20, 1893.

Balance on hand June 20, 1892.....	$795 76	
Annual receipts.....	670 00	
Total.....		$1465 76
Expenditures during the year.....	$725 29	
Cash balance on hand.....	740 47	
		$1465 76

Moved that the report be received and that the thanks of the Society be tendered the Treasurer for his faithful work during the past year.

Dr. F. D. Green reported a successful operation for the removal of a grain of corn from the larynx.

Dr. W. J. Rothwell read the Address in Medicine. It was discussed by Drs. LeMond, Gildea and Harrison.

A paper entitled, "Preventive Treatment of Complications of Typhoid Fever," was read by Dr. J. N. Hall. It was discussed by Dr. Axtell.

"The Causes of Œdema," was the title of a paper presented by Dr. Henry Sewall.

Dr. H. B. Whitney read his paper entitled, "Report of 58 Cases of Pneumonia in Colorado."

The last paper of the afternoon session was read Dr. H.W. McLauthlin. It was entitled, "Cold in the Treatment of Pyrexia," and was discussed by Drs. Gildea, Whitney and Munn.

All the papers were referred to the Publication Committee and at 4:30 the session adjourned.

EVENING SESSION.

At 8:15 the Society convened.

It was moved that all regular physicians present, though not members of the Society, be invited to take part in the discussion of the papers to be read.

President W. E. Wilson read his address. Moved that the thanks of the Society be extended to the president for his instructive and interesting paper.

The finance committee reported as follows:

"We have carefully examined the treasurer's accounts for the current year and find them correct and well kept."

The report was received.

Dr. W. F. McClelland presented a paper on the "Aseptic Qualities of the Colorado Atmosphere." It was discussed by Dr. Collins.

Prof. J. C. Dana, of the Denver Public Library, addressed the Society on the subject of "A Medical Library for Colorado."

It was moved that a vote of thanks be tendered Prof. Dana for his remarks and also for his interest in the Medical Library.

Moved that two hundred dollars be appropriated by the Society to the Medical Department of the Denver Public Library, and that a committee of three, not residents of Denver, be appointed by the chair to confer with Prof. Dana, in the expenditure of this money.

Moved that Dr. John Hall be added to the committee on admissions.

After adjournment of the evening session a reception was tendered the Society in the rooms of the Public Library, by the Colorado Library Association.

WEDNESDAY, JUNE 21st.

MORNING SESSION.

The Society was called to order at 9:45, a. m. by the president.

The committee on admissions reported favorably on the following named gentlemen:

Dr. J. J. Powers.....Denver.
" A. L. Craig.....Denver.
" J. W Higgins.....Denver.
" J. Tracey Melvin.....Saguache.
" M. A. Walker.....Denver.
" F. E. Waxham.....Denver.
" D. J. Scully.....Aspen.

On motion the secretary was instructed to cast a ballot for the admission of each.

Moved that Dr. B. B. Davis, of McCook, Nebraska, coming to us with credentials from the Nebraska State Medical Society, be received and accorded the courtesies of the society.

Dr. A. M. Holmes read a paper entitled "A Case of Dislocation of the Fourth Cervical Vertebra Without Fracture." The paper was discussed by Drs. Yoakum, Kahn and Parkhill.

"The Early Treatment of Club Foot" was the title of a paper presented by Dr. Geo. B. Packard, and discussed by Drs. Munn and Parkhill.

A paper entitled "Removal of the Gasserion Ganglion" was read by Dr. Clayton Parkhill and discussed by Dr. Hawes.

"Amputation" was the subject of a paper presented by Dr. G. W. Miel.

Dr. E. J. A. Rogers read a paper entitled "Conservatism in Accidental Surgery." He presented a number of patients. The paper was discussed by Drs. Eskridge and Lemen.

All the papers of the Surgical Section were referred to the Publication Committee.

AFTERNOON SESSION.

The Committee on Admissions reported favorably on the following named physicians:

Dr. J. A. Clinger.....Fountain, Colo.
Dr. T. A. Stoddard.....Pueblo, "

On motion the Secretary was instructed to cast a ballot for the admission of each.

"The Semeiology of Insanity" was the title of a paper presented by Dr. Eugene Grissom and discussed by Drs. Yoakum and Wilson.

Dr. E. R. Axtell read a paper entitled, "Vaso-Motor Disturbance, with Report of a Case." It was discussed by Drs. Eskridge, Hall and Pershing.

The President announced that he had appointed the following named gentlemen as a Library Committee, to expend the two hundred dollars donated by the Society to the Denver Public Library:

Dr. Jesse Hawes,.....Greeley.
" H. C. Crouch,.....Colorado Springs.
" J. F. Elliott,.....Idaho Springs.

Dr. J. T. Eskridge read his paper entitled, "Some Points in the Diagnosis and Treatment of Intracerebral Hæmorrhage and in the Treatment of Chorea." The paper was discussed by Drs. Pershing, Axtell, Collins and Wilson.

"Hysteria in Men" was the subject of a paper presented by Dr. Howell T. Pershing.

Dr. A. G. Case read a paper entitled, "Intubation of the Larynx."

The Committee appointed by the President to purchase books for the Denver Public Library, asked that all the outside members of the Society send to the committee a list of books, which in their opinion would be the best for the Committee to purchase.

Dr. F. E. Waxham read the last paper of the afternoon, entitled, "Report of 446 Cases of Intubation." He exhibited a number of improved instruments.

It was moved that the Society tender its thanks to Dr. Waxham and to Dr. Case for their valuable reports on Intubation.

All the papers were referred to the Publication Committee.

EVENING SESSION.

The Society convened at 8:30.

Prof. Coppen Jones read the paper of the evening, entitled, "Flies, As Carriers of Infective Material." It was referred to the Publication Committee

The Committee on Admissions reported favorably on the name of Dr. Alfred R. Seebass and on motion the Secretary was instructed to cast a ballot for his election.

The Symposium on Anæsthetics was opened by Dr. J. N. Hall. He was in turn followed by Drs. Hawes, Eskridge, Pfeiffer, Miel, Wilson, Whitney, H. A. Lemen, Davis (of McCook, Nebraska,) and Sears. The discussion occupied the entire evening.

After the evening session a banquet was held in the hall.

THURSDAY, JUNE 22nd.

MORNING SESSION.

At 10 a. m. the session was called to order by President Wilson.

The Committee on By-Laws reported that they had no suggestion of revision to offer.

The first paper of the morning was read by Dr. W. W. Grant. It was entitled, "Indications for the Use of the Uterine Curette," and was discussed by Drs. Collins, Whitney, Munn and Strickler.

Dr. Laura L. Liebhardt read a paper entitled, "Our School Girl." It was discussed by Dr. Davis.

On motion, further discussion of the morning papers was postponed until the afternoon session.

Dr. John M. Keating read the next paper, entitled, "Influence of Child-Life in the Production of Uterine Diseases."

The Address in Gynecology was read by Dr. J. W. Collins.

All the papers of the morning were referred to the Publication Committee.

Dr. O. J. Pfeiffer exhibited a patient to the Society in which a severe crush of the elbow, with excision, had been followed by an excellent result.

AFTERNOON SESSION.

At 1:30 the Society convened.

The discussion of the morning papers was taken part in by Drs. Collins, Yoakum, Davison, Anderson, Kahn and Wilson.

The Committee on Legislation reported as follows, through Dr. Henry Sewall:

"The last year has been an uncommonly important one as regards the relation of Medicine to the State. There was introduced before the recent Legislature, a bill for the amendment of the regulations for the conduct of the State Board of Medical Examiners, which bill failed to pass. There was a divided opinion among those interested, as to whether this bill was an advisable one or not.

However, Dr. Hall, the Secretary of the State Board of Medical Examiners informed us that the medical requirements as adopted by that Board, have made a very marked advance within the last few months. On April 10th of this year, there went into effect a bill which had been introduced before a preceding Legislature, by which the requirements of practice in this State were very much elevated. Now diplomas are not accepted broadcast as formerly, but there is a choice of diplomas only from those schools which have a three years course in the fundamentals of medicine, and such as have separate chairs of

Hygiene, Sanitary Science, etc., and we understand from Dr. Hall that even diplomas thus received are selected according to the judgment of the Board.

All those practitioners whose diplomas are not thus received, must pass an examination equal in stringency to that required in the Medical Colleges of Colorado.

So much for the State Board, and qualifications of practice.

The most important matter that came up before the recent Legislature, was the consideration of the bill for the establishment of a State Board of Health, really for a re-organization of such a Board. Under the beneficent influence of the cholera scare, Governor Routt appointed, or rather re-appointed a State Board of Health, which Board as you know had been in existence for 10 or 12 years, but which was in a state of (as a legislator called it) "Inoxious desitude." This Board had as its head, the late lamented Dr. Steele. We found that the laws having to do with this institution, were very incomplete, in that they gave but limited power to the Board. The first step taken was the drawing up of a bill for presentation to the Legislature, by means of which it was hoped, that the duties of the different communities through the State, and the powers of the State Board of Health in enforcing these duties, were to be expressly stated, and put upon the Statutes. Two bills were introduced, one for the establishment of local boards of health in every community in the State, and another for the establishment of a State Board of Health.

These bills were put into the hands of Senator Hartzell, and it is chiefly owing to his energy that they were passed. We call attention to the fact that these laws are very broad, and so far as we can see, they cover the most important conditions which can directly or indirectly affect the health of the people.

The State Board of Health solicits the sympathy and encouragement of every medical man and woman in Colorado. It is a work which in very recent years has made great and rapid strides, this prevention of disease, and I feel I voice the sentiment of the whole Board when I beg your sympathy.

On motion the report was received and accepted, with the thanks of the Society.

Dr. John T. Davison read the first paper of the afternoon, entitled, "Secondary Post-Partum Hemorrhage."

"Distocia from Contracted Pelvis," was the title of a paper presented by Dr. T. E. Taylor. It was discussed by Dr. Grissom.

Dr. Kate Reynolds Lobingier read a paper entitled, "Essential Details in the Conduct of Labor." It was discussed by Drs. Grissom, Munn, Hall, Davison, Sewall, Taylor, P. D. Rothwell and Wilson.

The Committee on Necrology reported as follows, through Dr. C. B. Lyman:

Your Committee on Necrology would herewith respectfully submit its report for the 12 months ending June 20, 1893.

During this period death has been busy gathering in a rich harvest, more noticeable perhaps on account of the prominence of those who are gone, for during that period we have lost three of our ex-presidents, two of them members of this Society since its organization in 1871; all of them highly respected in the community and dearly loved by all who knew them.

Dr. C. M. Parker, a member of this Society since 1873, died in Denver, August 12th, 1892, aged 54 years; for several years a prominent man in the medical profession of this city, and Professor of the Principles and Practice of Medicine in the Medical Department of the Denver University.

Dr. E. J. Wicks died August 25th, 1892, while yet in the prime of life, being only 34 years old.

Dr. J. C. Davis, who died October 8th, 1892, in a foreign country where he had gone in the vain search for health, was one of our ex-presidents, having filled that position during the year 1885; old in years he was yet as young as any of us in spirit, whom but to know was to admire and respect; a hard worker, a genial companion and a firm friend; for some years Dean of the Medical Department of the University of Denver, and Professor of Surgery in the same institution.

Dr. H. K. Steele died Jan. 20th 1893, at the age of 68 years In his death the Society has lost one of its original members and one who always had the interests of the Society at heart; a good man, doctor and friend, one whose name will never be forgotton while any of us live. Dr. Steele was one of our earliest presidents, having filled that position during the year 1874. He was the first Dean of the Medical Department of the University of Denver and for a long time he held the position of Professor of Surgery in that institution and afterwards Emeritus Professor of Surgery in the same school. At the time of his death he was occupying the position of Health Commissioner of the City of Denver.

Dr. W. H. Williams, who was one of the members of this Society since its organization, and its president during the year 1876, died in Denver, March 15, 1893, at the age of 53, after 10 years of suffering. During the last years of his life he was not an active practitioner of medicine, but the older members of the Society will remember him as a hard worker. A man who was always kind to the poor when they were sick, he had many friends amongst that class, who wept when he was dead.

The Committee on Admissions reported favorably on the names of Drs. E. Sirois and A. W. Coleman, both of Denver.

On motion the Secretary was instructed to cast a ballot for the admission of each.

Dr. C. F. Shollenberger read a paper-entitled,"Spontaneous Abortion," which was discussed by Dr. Whitehead.

The Medical Ethics Committee on being called to report, stated that they had no report to offer.

On motion a vote of thanks was tendered Dr, John M. Foster for his kindness in providing an entertainment for the Society at Manhattan Beach.

The Corresponding Secretary reported as follows:

The Secretary begs to report the property of the Society in good condition.

The money collected as dues from members and turned over to Dr. W. F. McClelland, Treasurer, for the current year,

viz.: June 24, 1892 to June 19, 1893, amounted to Four Hundred Dollars ($400.)

Officers for the ensuing year were then elected:

Dr. E. J. A. Rogers, Denver, President.
" A. M. Bucknum, Denver, First Vice-President.
" M. Harrison, Aspen, Second Vice-President.
" Kate Reynolds Lobingier, Denver, Third Vice-President.
" A. S. Lobingier, Denver, Corresponding Secretary.
" E. R. Axtell, Denver, Recording Secretary.
" W. P. Munn, Denver, Assistant Recording Secretary.
" W. F. McClelland, Denver, Treasurer.

Moved that the present Board of Trustees be re-elected and that Dr. S. A. Fisk be chosen to fill the position occasioned by the death of Dr. J. C. Davis.

Moved that the Committee on Admissions consist of Drs. J. N. Hall, W. P. Munn, S. G. Bonney and John Chase.

Moved that the Society tender a vote of thanks to the retiring President, Dr. W. E. Wilson, to Dr. W. P. Munn, of the Executive Committee and to the officers of the past year.

Moved that the Chair appoint a committee for the consideration of the establishment of a National Bureau of Health.

On motion the Colorado State Medical Society expressed itself as opposed to any modification of the American Code of Ethics, at this time, as unwise and unnecessary.

It was moved that the Publication Committee have the future transactions of the Society bound in cloth.

On motion the usual annual assessment of five dollars was laid upon the members.

Moved that Section I, of Article XII, of the By-Laws, be amended to read; "The Corresponding Secretary will receive, as compensation for the faithful discharge of his duties, one hundred dollars ($100.) per annum."

It was moved that those who had read papers before the

Society be given permission to have them published wherever they wish.

On motion the Twenty-Third Annual Session of the Colorado State Medical Society stood adjourned.

E. R. AXTELL, M. D.,
Recording Secretary.

BY-LAWS.

ARTICLE I.

Members.

Any regular graduate of medicine and surgery may become a member of this Society, who, by his adherence to the Code of Ethics of the American Medical Association, shows himself entitled to the confidence and fellowship of his medical brethren, and who, by his general conduct and mode of life, proves himself worthy of being a member of one of the learned and liberal professions.

ARTICLE II.

SECTION 1. Every candidate for membership in the Colorado State Medical Society, shall make a written application to the Committee on Admission, and such application shall be accompanied by a diploma or certificate vouching for possession of the same from some regular Medical College of good standing; and his reputation shall be vouched for, in writing, by at least two members of the Society.

SEC. 2. If this committee shall report favorably thereon to the Society, the candidate shall be balloted for, and the approving votes of three-fourths of the members present shall be necessary to his admission.

ARTICLE III.

No individual who shall be under sentence of expulsion or suspension from any state or local medical society of which he may have been a member, or whose name shall have been, for non-payment of dues, dropped from the rolls of the same, shall

be received as a member of this Society, or be allowed any of the privileges of a member, until he shall have been relieved from the said sentence or disability by such Society, or shall have paid up all arrears of membership; nor shall any person, not a member and supporter of a local medical society, where such a one exists, be eligible to membership in the State Medical Society of Colorado.

ARTICLE IV.

Honorary membership may be conferred by a vote of two-thirds of the members present at any regular meeting of the Society, upon worthy and distinguished medical gentlemen.

ARTICLE V.

Initiation Fee.

All the members of the Society (honorary excepted), shall, at the time of their admission, sign the Constitution and pay an initiation fee of five dollars, nor shall membership be consummated until the provisions of this article are complied with.

ARTICLE VI.

Assessments.

All members shall pay such annual assessments as may be made from time to time by the Society. Said assessments to fall due at the annual meeting when made.

ARTICLE VII.

Officers.

The officers of this Society shall be a President, three Vice-Presidents, designated and elected specially, as first, second and third Vice-Presidents, a Corresponding Secretary, a Recording Secretary, a Treasurer and a Standing Committee on Admission of Members, all of whom shall be elected annually by ballot, and by a majority vote, at the regular meeting, to serve until their successors are duly elected and qualified.

ARTICLE VIII.

Board of Trustees.

The members of this Society shall also, at each annual meeting, elect a Board of Trustees, consisting of seven members—of which Board the officers elect of this Society may constitute a part—in whom shall be vested the government of the Society and the management of its business. The Board shall be authorized to elect their own officers, and shall serve until their successors are duly elected and qualified.

ARTICLE IX.

Committees.

The following Standing Committees shall be annually appointed by the president: 1st, an Executive Committee; 2d, a Committee on Finance; 3d, on Publication; 4th, on Medical Ethics; 5th, on Medical Societies; 6th, on Necrology; 7th, on Legislation; 8th, on By-Laws.

ARTICLE X.

Duties of Officers.

It shall be the duty of the President to preside at all regular meetings of the Society, enforce a due observance of the Constitution and By-Laws, see that all members of committees and officers perform their respective duties, appoint all committees not otherwise provided for, give the casting vote only, sign diplomas and all other official documents requiring his signature, and perform such duties as pertain to his office by usage and custom.

ARTICLE XI.

The Vice-Presidents shall assist the President in the performance of his duties, and in his absence shall preside in order of their rank.

ARTICLE XII.

SECTION 1. The Corresponding Secretary shall conduct

the correspondence of the Society; notify the Chairman of committees of their appointments, and request them to answer in writing whether or not they accept; give due notice of annual meetings; sign diplomas, and certify to all official acts requiring the same; receive the signature and initiation fees of all duly elected members, and the annual dues of all members, transferring all moneys so received to the Treasurer; have the charge of all books, manuscripts, instruments, preparations and other scientific property belonging to the Society, and shall keep a catalogue of the same, and report on the condition of the same at the annual meetings. The Corresponding Secretary will receive, as compensation for the faithful discharge of his duties, the sum of one hundred dollars ($100) per annum.

SEC. 2. The Recording Secretary shall keep correct minutes of the proceedings of the Society, and make a full report of the discussions on all papers, take charge of the minute books and other documents and papers read before the Society, immediately at the close of each session, and keep them during the intervals, subject to the inspection of any member desirous of so doing. If necessary, in order to give a full and correct report of all proceedings and discussions, he shall, at his own expense, furnish a stenographer during the sessions of the Society. The Recording Secretary shall receive as compensation for the faithful discharge of his duties, the sum of fifty dollars ($50) per annum.

ARTICLE XIII.

The Treasurer shall receive all moneys due to the Society, and pay all bills endorsed by the Finance Committee, and countersigned by the President; keeping correct accounts of the same and making a full and detailed report of the annual meeting.

ARTICLE XIV.

Any member who shall fail to pay his dues for a period of three years shall be dropped from the roll of membership, and so notified by the Secretary.

ARTICLE XV.

Duties of Committees.

Standing committees shall keep regular minutes of their proceedings, and furnish an authentic copy to the Secretary, and make a written report at the annual meeting.

ARTICLE XVI.

It shall be the duty of the Committee on Admission, upon receiving the names of candidates for membership, to make inquiry and report such as may be found worthy, to the Society, which may thereupon elect him. Should the committee fail to report upon such nominations submitted to them, any members having made such nominations may renew the same directly to the Society, in which case a vote of four-fifths of the members present shall be requisite to constitute an election.

ARTICLE XVII.

The Executive Committee shall digest and prepare the business of each meeting, provide suitable rooms for the purpose of the Society, recommend plans for the promotion of its objects, and in all things protect and look after the general interests of the Society.

ARTICLE XVIII.

The Committee on Finance shall superintend the monetary affairs of the Society, inspect and audit all bills and accounts of the Treasurer, and make such an assessment by a *pro rata* tax upon the resident members, as may be necessary for the incidental expenses, subject, however, to the approval of the Society.

ARTICLE XIX.

The Committee on Publication shall superintend the printing of such papers, with the full discussion thereon as may be

ordered to be published, so that they may be issued on uniform paper. The publication of the transactions shall not be permitted until final revision of proof and its adoption, with permission to print, signed by a majority of the Committee on Publication, and under the title: "*Transactions.*"

Article XX.

The Committee on Ethics shall hear all complaints of breach of etiquette, or violation of medical ethics. It shall decide all questions of ethics submitted to it. If any member shall be charged in writing by any other member of the Society with any violation of the provisions of the By-laws, or with unprofessional conduct, a copy of such charge shall be furnished him; himself and his accuser cited to appear; when the committee shall proceed to hear the case, reserving its decision to be reported to the Society, when its action may be affirmed by a vote of two-thirds of the members present.

Article XXI.

The Committee on Medical Societies shall consider and report on the organization of such medical societies as desire to become auxiliary to the State Medical Society, and generally take charge of this department, making at each annual meeting as complete a report as practicable.

Article XXII.

The Committee on Necrology shall report the death of any member of the Society, with a brief biography, and this report shall be published in the Transactions.

Article XXIII.

The Committee on Legislation shall report to the Society any matter concerning its welfare which requires State legisla-

tion, and see that the same is properly presented to the legislature for action if so instructed by the Society.

Article XXIV.

The Committee on By-Laws shall report to the Society any needed change in its By-Laws.

Article XXV.

Discipline.

A member may be expelled, suspended or reprimanded by a vote of two-thirds of the members present at any annual meeting, which vote shall be had in consequence of a report from the Committee on Ethics, and which may be confirmed by a majority of the Board of Trustees.

Article XXVI.

Any member wishing to withdraw from the Society shall be permitted to do so on his written request, after he shall have presented the Treasurer's receipt for all moneys due.

Article XXVII.

The regular meeting shall be held annually, and shall commence on the third Tuesday of June of each year. The place of meeting shall be Denver, and a banquet shall be given on the evening of the last day, as arranged for by the Executive Committee.

Article XXVIII.

Special meetings may be called at any time by the Board of Trustees.

Article XXIX.

At all meetings the presence of nine resident members shall be necessary to constitute a quorum.

ARTICLE XXX.

The order of proceedings shall be as follows:

1. Opening of meeting by prayer.
2. Reading of minutes by Secretary.
3. Annual address by retiring President.
4. Annual report of Officers and Standing Committees.
5. Election of Officers.
6. Annual and Special Committees' report.
7. Voluntary papers, contributions, reports.
8. Annual assessment shall be laid by resolution.
9. Miscellaneous business.
10. President elect shall assume the chair and announce committees for succeeding year.

ARTICLE XXXI.

These By-Laws may be repealed, annulled, altered or amended at a regular meeting, on the recommendation of two-thirds of the members present.

PRESIDENTS OF THE SOCIETY.

1871—*R. G. Buckingham, M. D.....Denver
1872—W. F. McClelland, M. D.....Denver
1873—*G. S. McMurtrie, M. D.....Central
1874—*H. K. Steele, M. D.....Denver
1875—*W. H. Thacker, M. D.....Denver
1875—H. O. Dodge, M. D.....Boulder
1876—*W. H. Williams, M. D.....Denver
1877—T. G. Horn, M. D.....Colorado Springs
1878—A. Stedman, M. D.....Denver
1879—B. P. Anderson, M. D.....Colorado Springs
1880—F. J. Bancroft, M. D.....Denver
1881—H. A. Lemen, M. D.....Denver
1882—P. R. Thombs, M. D.....Pueblo
1883—W. R. Whitehead, M. D.....Denver
1884—Jesse Hawes, M. D.....Greeley
1885—*J. C. Davis, M. D.....Denver
1886—J. W. Graham, M. D.....Denver
1887—S. E. Solly, M. D.....Colorado Springs
1888—S. A. Fisk, M. D.....Denver
1889—J. W. Collins, M. D.....Denver
1890—J. T. Eskridge, M. D.....Denver
1891—W. M. Strickler, M. D.....Colorado Springs
1892—W. E. Wilson, M. D.....Denver
1893—E. J. A. Rogers, M. D.....Denver

*Deceased.

LIST OF MEMBERS.

Date.		
1888	Adams, B. F. D.	Colorado Springs
1873	Anderson, B. P.	Colorado Springs
1886	Arbogast, B. A.	Breckenridge
1887	Auerbach, L.	Denver
1892	Axtell, E. R.	Denver
1892	Ashbaugh, A.	Central City
1891	Baker. A. J	Denver
1890	Baker. M	Denver
1871	Bancroft, F. J	Denver
1878	Beshoar, M.	Trinidad
1879	Blickensderfer, J. C.	Denver
1884	Bonesteel, S. A.	Denver
1888	Bonnet, W. M.	Monument
1888	Boice, Jno	Denver
1885	Bosanko, S. Authur	Leadville
1883	Bucknum, A. M.	Denver
1889	Bucknum, H. H.	Denver
1884	Burns, C. P.	Denver
1892	Bonney, S. G	Denver
1892	Bates, Mary E	Denver
1892	Bates, Mary H. Barker	Denver
1892	Bellrose, Norman W	Eaton
1892	Bane, W. C.	Denver
1892	Black, G. Melville	Denver
1883	Carlin, P. V	Denver
1889	Catanach, A. J	Denver
1886	Chase, John	Denver
1883	Clark, J. K	Denver
1889	Clark, J. L.	Denver
1884	Cleary, Geo	Denver
1889	Clough, A.A	Denver

1880	Collins, J. W	Denver
1893	Coleman, A	Denver
1890	Coover, D. H	Denver
1882	Corwin, R. W	Pueblo
1883	Craig, W. B	Denver
1893	Craig, A. L	Denver
1878	Craven, T. H	Canon City
1888	Crocker, F. B	Littleton
1892	Crouch, H. C	Colorado Springs
1892	Campbell, W. A	Colorado Springs
1880	D'Avignon, F. F	Leadville
1878	Dawson, J. W	Canon City
1891	Davison, Jno. T	Denver
1874	Denison, Chas	Denver
1882	Duggins, G. G	Pueblo
1887	Dorland, W. L	Pueblo
1892	Debeque, W. A. E	Debeque
1892	Davidson, Jno	Central City
1892	Dunscombe, E	Glenwood Springs
1892	Davis, W. C	Denver
1884	Earhart, W. R	Boulder
1871	Edmundson, W	Denver
1891	Elliott, Jno. F	Idaho Springs
1871	Elsner, Jno	Denver
1885	Eskridge, J. T	Denver
1890	Exline, J. W	Denver
1892	Estes, N. D	Alamosa
1885	Finfrock, J. H	Laramie City, Wyo
1888	Finney, Frank	La Junta
1882	Fisk, S. A	Denver
1891	Fleming, C. K	Denver
1885	Forhan, T. J	Rouse
1891	Foster, Jno. M	Denver
1885	Galloway, B. S	Leadville
1888	Gardiner, C. F	Colorado Springs
1886	Gibson, G. H	Denver
1886	Giffin, L. M	Boulder
1893	Gildea, P. F	Colorado Springs

1890	Girvin, E. R	Denver
1879	Graham, J. W	Denver
1885	Graham, R. F	Greeley
1890	Grant, W. W	Denver
1893	Green, Frank D	Pueblo
1880	Greene, J. L	Red Cliff
1891	Grissom, Eugene	Lafayette
1884	Hall, J. N	Denver
1889	Hart, James A	Colorado Springs
1888	Hay, Rilla G	Pueblo
1888	Harrison, M	Aspen
1885	Hassenplug, G. K	Denver
1879	Hawes, Jesse	Greeley
1880	Hawkins, T. H	Denver
1891	Herrick, J. C	Denver
1893	Hershey, E. P	Denver
1893	Higgins, J. W	Denver
1884	Howland, H. H	Denver
1875	Horn, T. G	Colorado Springs
1886	Hughes, T. A	Denver
1892	Haskins, B. F	La Junta
1892	Hunt, Wilbur N	Cheyenne, Wyo
1892	Hawk, J. W	Denver
1892	Hutchinson, J. Cooper	Florissant
1892	Holmes, A. M	Denver
1884	Jayne, W. A	Denver
1891	Kahn, Sol. J	Leadville
1884	Kelley, J. P	Golden
1880	Kimball, J. H	Denver
1890	King, A. T	Pueblo
1892	Keating, John M	Colorado Springs
1892	Kahn, Lee	Leadville
1893	Keith, John G	Leadville
1892	Kleiner, M	Denver
1881	Lay, F. H	Denver
1891	Law, G	Greeley
1875	Law, John	Leadville
1889	Leavitt, B.C	Denver

1882	Lee, E. A	Fort Collins
1874	Lemen, H. A	Denver
1873	Lemen, L. E	Denver
1887	Levy, Robert	Denver
1891	Liebhardt, Laura L	Denver
1890	Lobingier, A. Stewart	Denver
1891	Lobingier, Kate R	Denver
1893	Lowrey, Mary T	Boulder
1888	Lyman, C. B	Denver
1871	McClelland, W. F	Denver
1881	McDonald, W. H	Pueblo
1884	McLauthlin, H.W	Denver
1891	McNaught, F. H	Denver
1890	McPhatter, Neil	Denver
1892	Marquette, Madelene	Denver
1892	McHugh, P. J	Fort Collins
1893	Manly, Chas	Denver
1892	Marbourg, E M	Pueblo
1893	Melvin, J. Tracy	Saguache
1892	Mentzer, O. F	Denver
1892	Miel, Geo.W	Denver
1891	Munn, W. P	Denver
1882	O'Connor, J.W	Denver
1889	Olmstead, Wm. A	Pueblo
1890	Packward, Geo. B	Denver
1885	Parkhill, Clayton	Denver
1890	Pershing, H. T	Denver
1886	Perkins, A	Denver
1887	Perkins, I. B	Denver
1885	Pfeiffer, O. J	Denver
1882	Phillips, G. W	La Junta
1892	Pring, E. J	Watrous, N.M
1892	Powers, J W	Idaho Springs
1893	Powers, J. J	Denver
1892	Perry, B. J	Aspen
1890	Rader, W. H	Durango
1877	Reed, Jacob Jr	Colorado Springs
1882	Rivers, E. C	Denver

1885	Robertson, W. M	Denver
1887	Robinson, A. J	Aspen
1889	Robinson, J. R	Colorado Springs
1883	Rogers, E. J. A	Denver
1884	Rothwell, E. J	Denver
1884	Rothwell, P. D	Denver
1889	Rothwell, Wm. J	Denver
1892	Rose, Edward P	Aspen
1892	Ruedi, C	Denver
1892	Robinson, G. W	Trinidad
1893	Seebass, Alfred R	Denver
1891	Sewall, Henry	Denver
1893	Scully, D. J	Aspen
1891	Shaw, Robert T	Denver
1893	Sirois, E	Denver
1887	Shollenberger, C. F	Denver
1881	Simmons, O. H	Leadville
1889	Sleicher, J. M	Walsenburg
1875	Solly, S. E	Colorado Springs
1888	Spicer, O. W	Colorado Springs
1871	Stedman, A	Denver
1893	Stoddard, T. A	Pueblo
1879	Strickler, W. M	Colorado Springs
1892	Stuver, E	Rawlins, Wyo
1892	Sheets, Elmer A	Denver
1892	Snitcher, H. C	Denver
1892	Taylor, Hugh L	Denver
1889	Taylor, T. E	Denver
1888	Tauber, B	Denver
1890	Thayer, C. E	Denver
1878	Thombs, P. R	Pueblo
1880	Tucker, B. St. Geo	Colorado Springs
1892	Tucker, Beverly	Colorado Springs.
1891	Vroom J. N	Denver
1892	Van Meter, S. D	Denver
1892	Walker, L. M	Denver
1893	Walker, M. A	Denver
1893	Waxham, F. E	Denver

1882 Weiss, Loui.....Del Norte
1888 Weist, N.....Denver
1892 Wetherill, Horace G.....Colorado Springs
1891 Wetzel, D. E.....Denver
1873 Whitehead, W. R.....Denver
1888 Whitney, H. B.....Denver
1874 Wilson, W. E.....Denver
1885 Wood, L. H.....Denver
1889 Work, Hubert.....Pueblo
1887 Worthington, A. K.....Denver
1893 Yoakum, F. E.....Denver

HONORARY MEMBERS.

1880	O. D. Cass, M. D	Denver
1873	Hon. John Evans, M. D	Denver
1889	Thos. F. Rambold, M. D	St. Louis, Mo
1879	Dougan, D. H	Leadville

Total Membership 203

DECEASED MEMBERS.

NAME.	Year Elected.	Age.	Residence at Death.	Date of Death.	MEDICAL COLLEGE.	Year Grad.
Lionberger, D. B....	1872		Denver.....	1873....		
Davis, S. B	1873		Central City	1875....	Rush Medical College....	1865
					Univ. Med. College, N.Y..	1866
Johnson, G. L	1874		Denver	1875....	Med. Dept. Iowa University.	1872
LeCarpentier, Jules..	1875		Fairplay	1876....	University Paris.....	1865
Davis, M. J.....	1872		Golden	1876....		
Thacker, W. H.....	1871		Denver	1876....	Med. Dept. Univ. Michigan.	1862
Boone, S. H	1873		Denver	1877. ..	University Louisville, Ky...	1857
Lansingh, K. V. R...	1876		Denver	1879....	Albany Medical College....	1870
Dickinson, J. S	1871		Denver	1879....	Royal College Surg. Eng ...	
Taylor, R. T	1873		Leadville	1882....		
Gambell, F. W.....	1881		Leadville	1882....	Detroit Medical College....	1873
Warn, W. H.....	1879		Denver	1882....	Coll Phys. and Surg. N. Y.	1871
Wilson, M. A... ...	1880		Denver	1882....	Ohio Medical College	1866

Craven, J. S	1880		Pueblo	1884	Iowa State Univ. Med. Dept.	1867
Griffith, D. S	1882		Durango	1886	Jeff. Medical College	1863
MacLean, A. M	1881		Leadville	1886	Med. Dept. Univ. of Mich. Univ. Nashville Med. Dept.	1874 1863
Mavity, W. K	1884		Denver	1886	Jeff. Medical College	1865
McMurtrie, G. S	1873	61	Denver	August, 1887	Univ. Penn. Med. Dept	1860
Buckingham, R. G	1871	73	Denver	March 18, 1889	Berkshire Med. College	1836
Lathrop, Chas. C	1877	36	Denver	May 28, 1889	Bellevue Hosp. Med. College	1875
Fay, William M	1883	33	Denver	Jan'y 13, 1889	Kansas City Med. College	1881
Brumond, P. B	1884	43	Idaho Springs	Sept. 13, 1889	Chicago Medical College	1868
Grimes, W. S	1883	53	Denver	Dec. 21, 1889	Miami Medical College	1857
James, H. C	1881	50	Ouray	Jan'y 4, 1890	Jeff. Medical College	1870
Wooster, David	1888	37	Idaho Springs	April 8, 1891	Med. Dept. Univ. of Calif	1885
Keables, E. H	1888	71	Alma	Jan'y 6, 1892	Bellevue Hosp. Med. College	1861
Cory, J. B	1883	54	Denver	Jan'y 24, 1892	Med. Dept. Univ. Michigan	1862
Worthington, R. H	1884	46	Denver	May 13, 1892	Med. Dept. Univ. of Denver	1884

Parker, C. M.....	1878	54	Denver	Aug. 12, 1892....	Univ. of Louisiana.....	1859
					Med. College of Virginia.	1862
Wicks, E. G	1889	34	Denver	Aug. 26, 1892....	Med. Dept. Univ. of Md....	1888
Davis, J. C	1880		Zurich, Switz....	Oct. 8, 1892....	Castleton Medical College ..	1847
Steele, H. K	1871	68	Denver	Jan'y 20, 1893....	University City of New York	1848
Williams, W. H.....	1871	53	Denver	Mar. 15, 1893....	Univ. of Louisiana.....	1867

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